DVP-K370

RMT-D145B/D145E

SERVICE MANUAL

E Model
Brazilian Model

Self Diagnosis Supported model

Photo : DVP-K370
RMT-D145E

SPECIFICATIONS

System

Laser: Semiconductor laser
Signal format system: NTSC/PAL (See page 1-4 to switch)

Audio characteristics

Frequency response: DVD VIDEO (PCM 96 kHz): 2 Hz to 44 kHz (±1.0 dB)/DVD VIDEO (PCM 48 kHz): 2 Hz to 22 kHz (±0.5 dB)/CD: 2 Hz to 20 kHz (±0.5 dB)
Signal-to-noise ratio (S/N ratio): 115 dB (LINE OUT L/R (AUDIO) 1/2 jacks only)
Harmonic distortion: 0.003 %
Dynamic range: DVD VIDEO: 103 dB/CD: 99 dB
Wow and flutter: Less than detected value (±0.001% W PEAK)

The signals from LINE OUT L/R (AUDIO) 1/2 jacks are measured. When you play PCM sound tracks with a 96 kHz sampling frequency, the output signals from the DIGITAL OUT (OPTICAL or COAXIAL) jack are converted to 48 kHz sampling frequency.

Outputs and Input

(**Jack name:** Jack type/Output level/Load impedance)
LINE OUT (AUDIO) 1/2: Phono jack/ 2 Vrms/10 kilohms
DIGITAL OUT (OPTICAL): Optical output jack/–18 dBm (wave length: 660 nm)
DIGITAL OUT (COAXIAL): Phono jack/ 0.5 Vp-p/75 ohms
COMPONENT VIDEO OUT(Y, C_B, C_R): Phono jack/Y: 1.0 Vp-p, C_B, C_R: 0.7 Vp-p/75 ohms
LINE OUT (VIDEO) 1/2: Phono jack/ 1.0 Vp-p/75 ohms
S VIDEO OUT: 4-pin mini DIN/Y: 1.0 Vp-p, C: 0.3 Vp-p (PAL), 0.286 Vp-p (NTSC)/75 ohms
MIC: Phone jack

General

Power requirements:
220 – 240 V AC, 50/60 Hz
110 V AC, 60 Hz
See page 1-1 for further information.
Power consumption: 11 W/13 W
See page 1-1 for further information.
Dimensions (approx.): 430 × 74 × 260 mm (width/height/depth) incl. projecting parts
Mass (approx.): 2.5 kg
Operating temperature: 5 °C to 35 °C
Operating humidity: 25 % to 80 %

Supplied accessories

See page 1-3.

Specifications and design are subject to change without notice.

DVD VIDEO COMPACT disc DIGITAL VIDEO

CD/DVD PLAYER

SONY®

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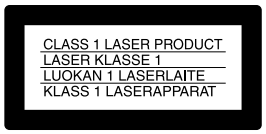
WARNING!!

WHEN SERVICING, DO NOT APPROACH THE LASER EXIT WITH THE EYE TOO CLOSELY. IN CASE IT IS NECESSARY TO CONFIRM LASER BEAM EMISSION, BE SURE TO OBSERVE FROM A DISTANCE OF MORE THAN 25 cm FROM THE SURFACE OF THE OBJECTIVE LENS ON THE OPTICAL PICK-UP BLOCK.

CAUTION:
The use of optical instrument with this product will increase eye hazard.

CAUTION
Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.



SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

Unleaded solder
Boards requiring use of unleaded solder are printed with the lead-free mark (LF) indicating the solder contains no lead.
(Caution: Some printed circuit boards may not come printed with the lead free mark due to their particular size.)

: LEAD FREE MARK
Unleaded solder has the following characteristics.
- Unleaded solder melts at a temperature about 40°C higher than ordinary solder.
  Ordinary soldering irons can be used but the iron tip has to be applied to the solder joint for a slightly longer time.
  Soldering irons using a temperature regulator should be set to about 350°C.
  Caution: The printed pattern (copper foil) may peel away if the heated tip is applied for too long, so be careful!
- Strong viscosity
  Unleaded solder is more viscous (sticky, less prone to flow) than ordinary solder so use caution not to let solder bridges occur such as on IC pins, etc.
- Usable with ordinary solder
  It is best to use only unleaded solder but unleaded solder may also be added to ordinary solder.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer.

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, through functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.
6. Flexible Circuit Board Repairing
   - Keep the temperature of the soldering iron around 270˚C during repairing.
   - Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
   - Be careful not to apply force on the conductor when soldering or unsoldering.

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1. DISC REMOVAL PROCEDURE (at POWER OFF)

1) Insert a driver into the aperture of the unit bottom, and move the lever of chuck cam in the direction of the arrow A. (See Fig. 1)
2) Draw out the tray in the direction of the arrow B, and remove a disc. (See Fig. 1)

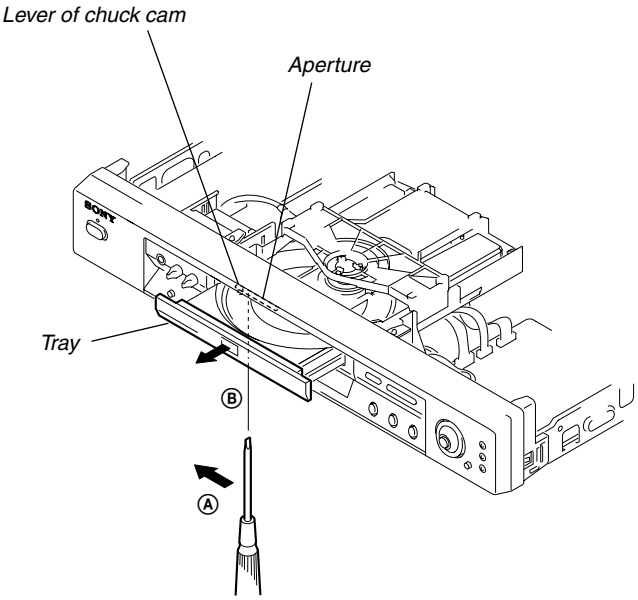
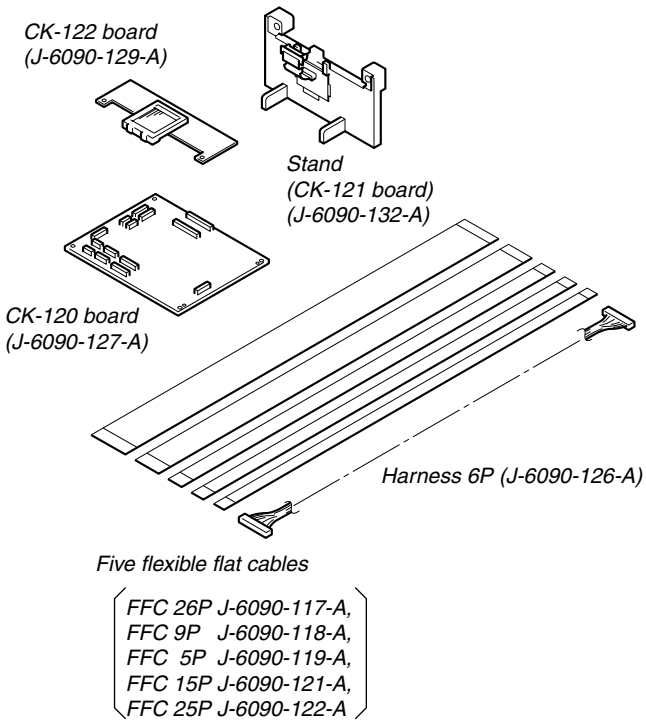


Fig. 1.

2. HOW TO SERVICE MB-103 BOARD

• Jig



Five flexible flat cables

FFC 26P J-6090-117-A,
FFC 9P J-6090-118-A,
FFC 5P J-6090-119-A,
FFC 15P J-6090-121-A,
FFC 25P J-6090-122-A

1) Remove the upper case from the set. (Refer to section 2-1)
2) Remove the MB-103 board. (Refer to section 2-6)
3) Set the MB-103 board in the stand (with CK-121 board) as shown in Fig. 2.

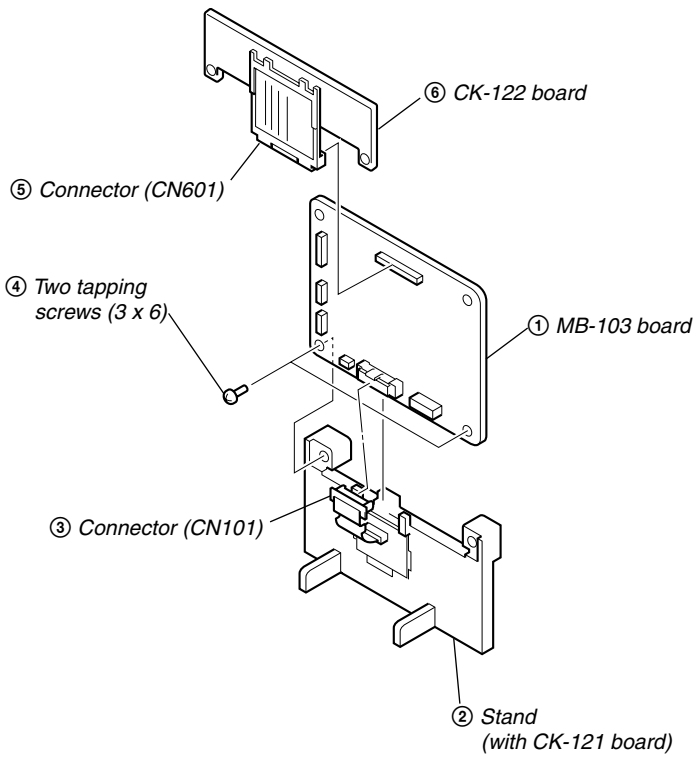


Fig. 2.

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4) Set the CK-120 board in the place where the MB-103 board is removed, as shown in Fig. 3.

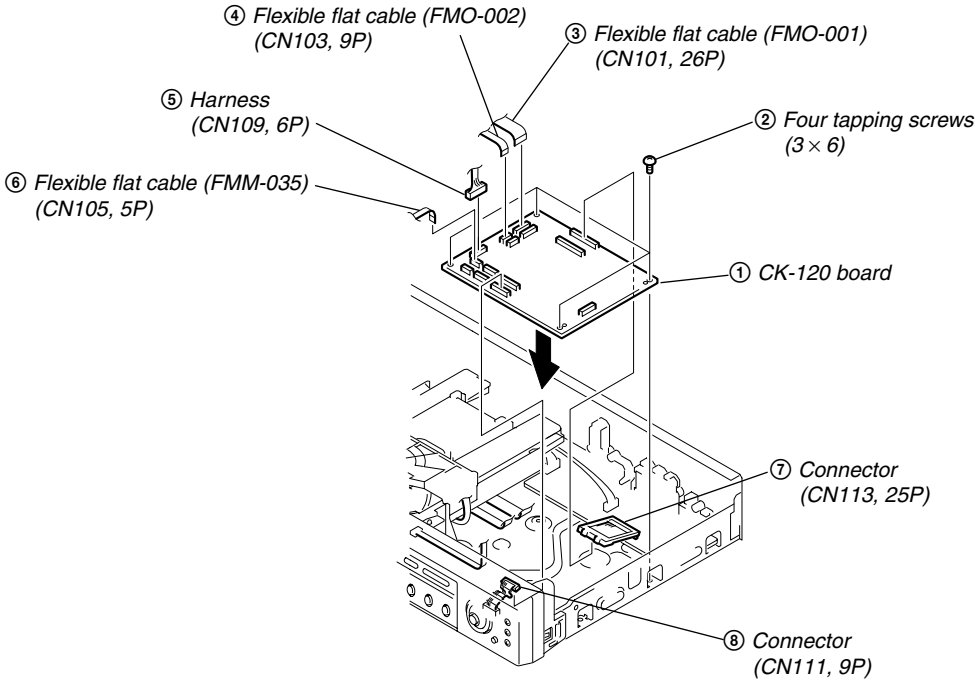

Fig. 3.

5) Set the four flexible flat cables as shown in Fig. 4.

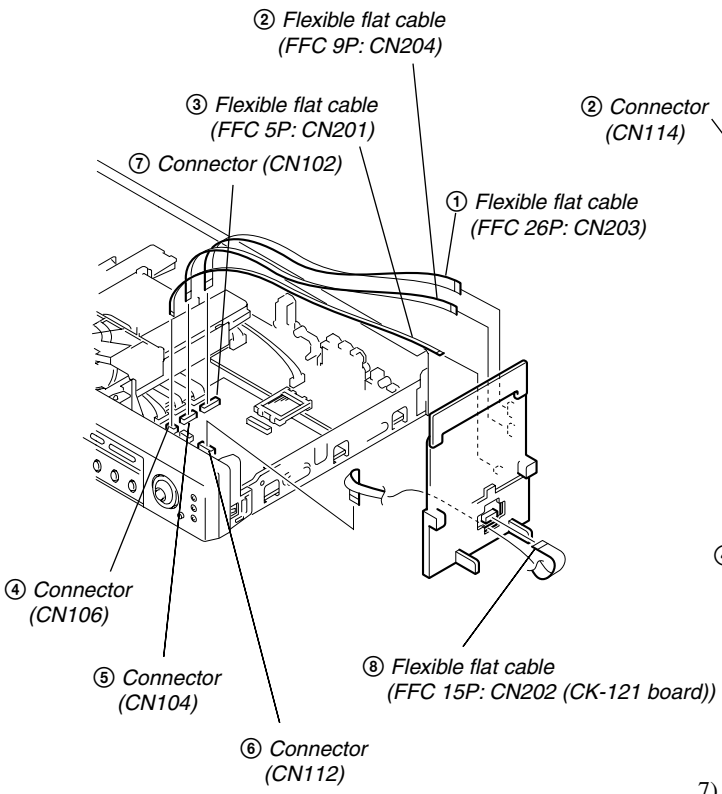

Fig. 4.

6) Set the flexible flat cable and the harness as shown in Fig. 5.

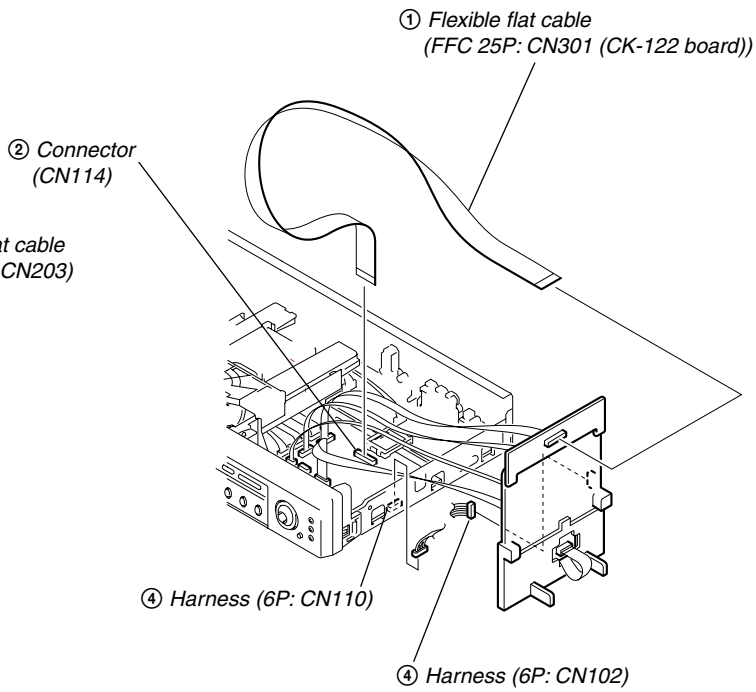

Fig. 5.

7) Set is finished.

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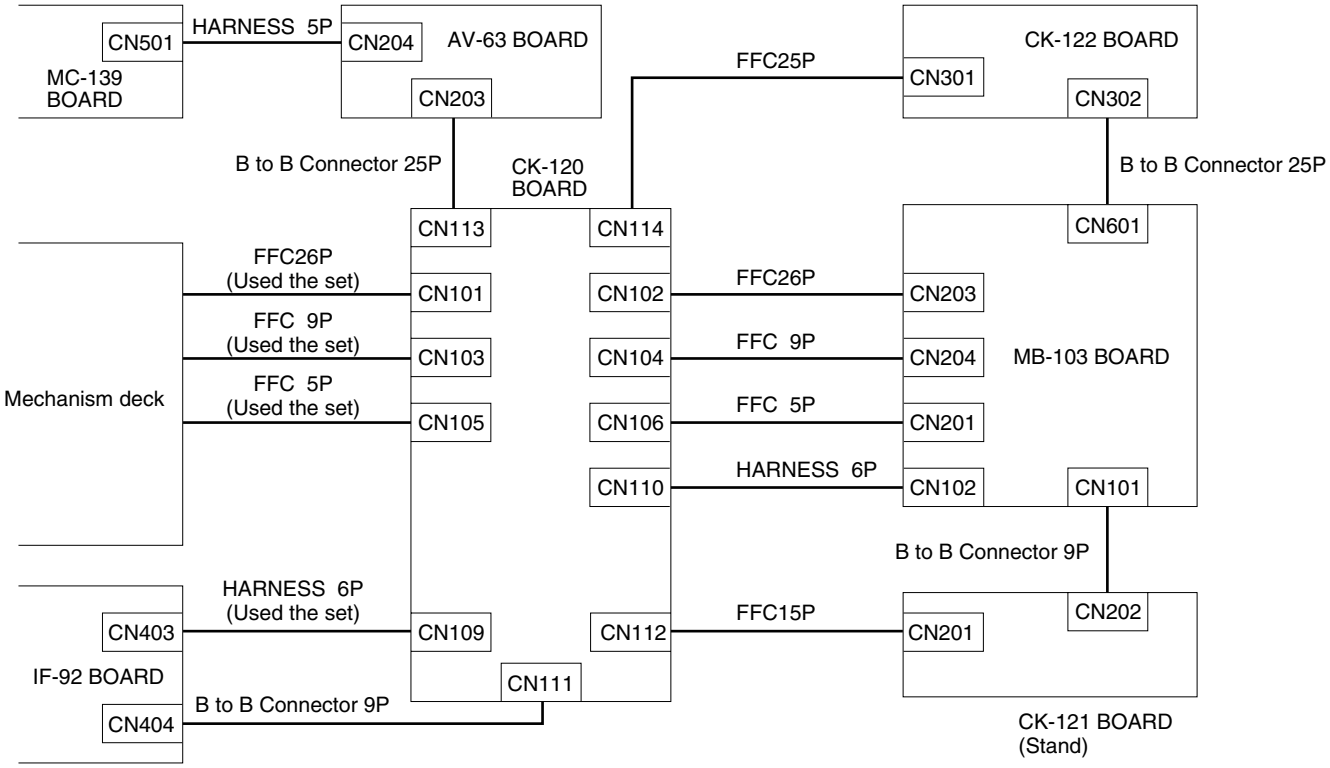
3. CONNECTION OF SERVICE JIG



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SECTION 1
GENERAL

This section is extracted from instruction manual. (DVP-K370 : 3-074-928-11)

WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.
To avoid electrical shock, do not open the cabinet. Refer servicing to qualified personnel only.
Mains lead must only be changed at a qualified service shop.

CAUTION

The use of optical instruments with this product will increase eye hazard. As the laser beam used in this CD/DVD player is harmful to eyes, do not attempt to disassemble the cabinet.
Refer servicing to qualified personnel only.

Precautions

Safety

- The power requirements and power consumption of this unit are indicated on the back of the unit. Check that the unit's operating voltage is identical with your local power supply.

Power requirements and power consumption

- To prevent fire or shock hazard, do not place objects filled with liquids, such as vases, on the apparatus.

Installing

- Do not install the unit in an inclined position. It is designed to be operated in a horizontal position only.
- Keep the unit and discs away from equipment with strong magnets, such as microwave ovens, or large loudspeakers.
- Do not place heavy objects on the unit.

Welcome!

Thank you for purchasing this Sony CD/DVD Player. Before operating this player, please read this manual thoroughly and retain it for future reference.

Precautions

On safety

- Caution – The use of optical instruments with this product will increase eye hazard.
- Should any solid object or liquid fall into the cabinet, unplug the player and have it checked by qualified personnel before operating it any further.

On power sources

- The player is not disconnected from the AC power source (mains) as long as it is connected to the wall outlet, even if the player itself has been turned off.
- If you are not going to use the player for a long time, be sure to disconnect the player from the wall outlet. To disconnect the AC power cord (mains lead), grasp the plug itself; never pull the cord.

On placement

- Place the player in a location with adequate ventilation to prevent heat build-up in the player.
- Do not place the player on a soft surface such as a rug that might block the ventilation holes.
- Do not place the player in a location near heat sources, or in a place subject to direct sunlight, excessive dust, or mechanical shock.

On operation

- If the player is brought directly from a cold to a warm location, or is placed in a very damp room, moisture may condense on the lenses inside the player. Should this occur, the player may not operate properly. In this case, remove the disc and leave the player turned on for about half an hour until the moisture evaporates.
- When you move the player, take out any discs. If you don't, the disc may be damaged.

On adjusting volume

Do not turn up the volume while listening to a section with very low level inputs or no audio signals. If you do, the speakers may be damaged when a peak level section is played.

On cleaning

Clean the cabinet, panel, and controls with a soft cloth slightly moistened with a mild detergent solution. Do not use any type of abrasive pad, scouring powder or solvent such as alcohol or benzine.
If you have any questions or problems concerning your player, please consult your nearest Sony dealer.

On cleaning discs

Do not use a commercially available cleaning disc. It may cause a malfunction.

IMPORTANT NOTICE

Caution: This player is capable of holding a still video image or on-screen display image on your television screen indefinitely. If you leave the still video image or on-screen display image displayed on your TV for an extended period of time you risk permanent damage to your television screen. Projection televisions are especially susceptible to this.

About this Manual

- Instructions in this manual describe the controls on the remote. You can also use the controls on the player if they have the same or similar names as those on the remote.
- Displays on the screen are slightly different depending upon where the model is sold.
- The meaning of the icons used in this manual is described below:

Icon	Meaning
DVD	Functions available for DVD VIDEOs or DVD-Rs/DVD-RWs in video mode
VCD	Functions available for VIDEO CDs or CD-Rs/CD-RWs in video CD format
DATA CD	Functions available for DATA CDs (CD-ROMs/CD-Rs/CD-RWs containing MP3* audio tracks)
CD	Functions available for music CDs or CD-Rs/CD-RWs in music CD format

* MP3 (MPEG 1 Audio Layer 3) is a standard format defined by ISO/MPEG which compresses audio data.

This Player Can Play the Following Discs

Format of discs	
DVD VIDEO	DVD VIDEO
VIDEO CD	COMPACT disc DIGITAL VIDEO
Music CD	COMPACT disc DIGITAL AUDIO

The "DVD VIDEO" logo is a trademark.

Region code

Your player has a region code printed on the back of the unit and only will play DVD VIDEO discs (playback only) labelled with identical region codes. This system is used to protect copyrights.

DVDs labelled (ALL) will also play on this player.

If you try to play any other DVD, the message "Playback prohibited by area limitations." will appear on the TV screen. Depending on the DVD, no region code indication may be labelled even though playing the DVD is prohibited by area restrictions.

Example of discs that the player cannot play

The player cannot play the following discs:

- All CD-ROMs (including PHOTO CDs)/ CD-Rs/CD-RWs other than those recorded in the following formats:
  – music CD format
  – video CD format
  – MP3 format that conforms to ISO9660* Level 1/Level 2, or its extended format, Joliet
- Data part of CD-Extras
- DVD-RWs in VR mode
- DVD-ROMs
- DVD Audio discs
- HD layer on Super Audio CDs

* A logical format of files and folders on CD-ROMs defined by ISO (International Standard Organization).

Also, the player cannot play the following discs:

- A DVD with a different region code.
- A disc that has a non-standard shape (e.g., card, heart).
- A disc with paper or stickers on it.
- A disc that has the adhesive of cellophane tape or a sticker still left on it.

Note

Some CD-Rs, CD-RWs, DVD-Rs, or DVD-RWs (in video mode) cannot be played on this player due to the recording quality or physical condition of the disc, or the characteristics of the recording device. Furthermore, the disc will not play if it has not been correctly finalized. For more information, see the operating instructions for the recording device. Note that discs created in the Packet Write format cannot be played.

Note on playback operations of DVDs and VIDEO CDs

Some playback operations of DVDs and VIDEO CDs may be intentionally set by software producers. Since this player plays DVDs and VIDEO CDs according to the disc contents the software producers designed, some playback features may not be available. Also, refer to the instructions supplied with the DVDs or VIDEO CDs.

Copyrights

This product incorporates copyright protection technology that is protected by method claims of certain U.S. patents, other intellectual property rights owned by Macrovision Corporation, and other rights owners. Use of this copyright protection technology must be authorized by Macrovision Corporation, and is intended for home and other limited viewing uses only unless otherwise authorized by Macrovision Corporation. Reverse engineering or disassembly is prohibited.

Notes about the Discs

- To keep the disc clean, handle the disc by its edge. Do not touch the surface.

- Do not expose the disc to direct sunlight or heat sources such as hot air ducts, or leave it in a car parked in direct sunlight as the temperature may rise considerably inside the car.
- After playing, store the disc in its case.
- Clean the disc with a cleaning cloth. Wipe the disc from the centre out.

- Do not use solvents such as benzine, thinner, commercially available cleaners, or anti-static spray intended for vinyl LPs.

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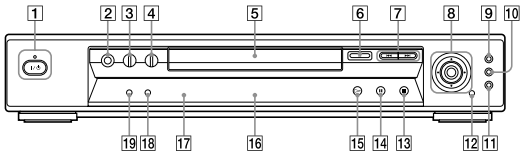
Index to Parts and Controls

For more information, refer to the pages indicated in parentheses.

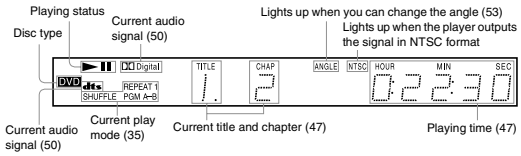
Front panel



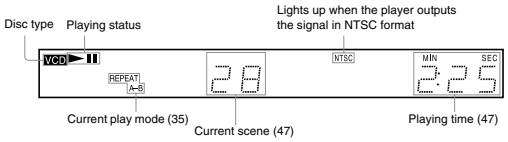
1 I/⏻ (on/standby) button/indicator (28)
Lights up in green when the power is on and lights up in red when the player is in standby mode.
2 MIC (microphone) connector (43)
3 MIC (microphone) LEVEL control (43)
4 ECHO LEVEL control (43)
5 Disc tray (28)
6 ⏏ (open/close) button (28)
7 I◀◀/▶▶I (previous/next) buttons (29)
8 ←/↑/↓/→ ENTER buttons (32)
9 TOP MENU button (32)
10 MENU button (32) (33)
11 ↩ RETURN button (29)
12 DISPLAY button (12)
13 ■ (stop) button (29)
14 ❚❚ (pause) button (29)
15 ▷ (play) button (28)
16 Front panel display (9)
17 (remote sensor) (15)
18 SURROUND button (51)
19 PICTURE MODE button (55)

Front panel display

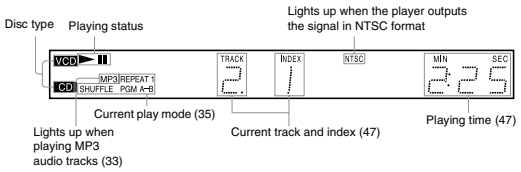
When playing back a DVD


Playing status
Disc type
Current audio signal (50)
Lights up when you can change the angle (53)
Lights up when the player outputs the signal in NTSC format
Current audio signal (50)
Current play mode (35)
Current title and chapter (47)
Playing time (47)

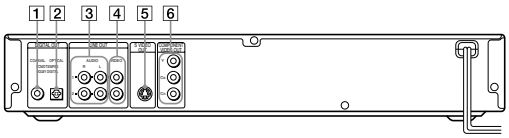
When playing back a VIDEO CD with Playback Control (PBC) (32)


Disc type
Playing status
Lights up when the player outputs the signal in NTSC format
Current play mode (35)
Current scene (47)
Playing time (47)

When playing back a CD, DATA CD (MP3 audio), or VIDEO CD (without PBC)

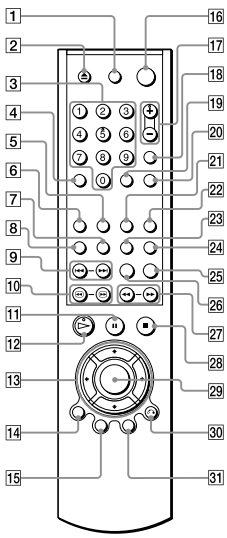

Disc type
Playing status
Lights up when the player outputs the signal in NTSC format
Current play mode (35)
Current track and index (47)
Playing time (47)
Lights up when playing MP3 audio tracks (33)

Rear panel



1 DIGITAL OUT (COAXIAL) jack (22) (23) (24)
2 DIGITAL OUT (OPTICAL) jack (22) (23) (24)
3 LINE OUT L/R (AUDIO) 1/2 jacks (21) (22) (23)
4 LINE OUT (VIDEO) 1/2 jacks (18)
5 S VIDEO OUT jack (18)
6 COMPONENT VIDEO OUT jacks (18)

Remote



1 TV I/⏻ (on/standby) button (62)
2 ⏏ OPEN/CLOSE button (29)
3 Number buttons (32)
The number 5 button has a tactile dot.*
4 CLEAR button (35)
5 SUBTITLE button (53)
6 AUDIO button (50)
7 REPEAT button (38)
8 VOCAL SELECT button (44)
9 I◀◀/▶▶I PREV (previous)/NEXT buttons (29)
10 ◀II⏮/⏭II▶ SEARCH/STEP buttons (30)
11 ❚❚ PAUSE button (29)
12 ▷ PLAY button (28)
The ▷ button has a tactile dot.*
13 ←/↑/↓/→ buttons (32)
14 DISPLAY button (12)
15 TOP MENU button (32)
16 I/⏻ (on/standby) button (28)
17 VOL (volume) +/– buttons (62)
The + button has a tactile dot.*
18 TV/VIDEO button (62)
19 ENTER button (performs the same function as 29)
20 TIME/TEXT button (46)
21 ANGLE button (53)
22 PICTURE NAVI (navigation) button (41)
23 SUR (surround) button (51)
24 PICTURE MODE button (55)
25 REPLAY button (29)
26 SEARCH MODE button (40)
27 ◄I ◄◄/►► I► SCAN/SLOW buttons (30)
28 ■ STOP button (29)
29 ENTER button (25)
30 ↩ RETURN button (29)
31 MENU button (32) (33)

* Use the tactile dot as a reference when operating the player.

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Guide to the Control Menu Display

Use the Control Menu to select a function and to view related information. Press DISPLAY repeatedly to turn on or change the Control Menu display as follows:

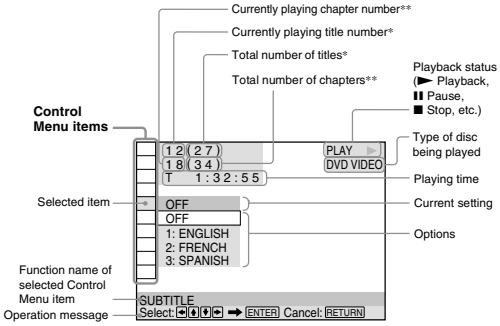
Control Menu display 1
↓
Control Menu display 2 (DVD/VIDEO CD only)
↓
ADVANCED display (DVD only, See page 48.)
↓
Control Menu display off

Hint
You can skip the ADVANCED display by setting "OFF" under "ADVANCED" in the Control Menu (page 48).

Control Menu Display

The Control Menu display 1 and 2 will show different items depending on the disc type. For details about each item, please refer to the pages in the parentheses.

Example: Control Menu display 1 when playing a DVD



* Displays the scene number for VIDEO CDs (PBC is on), track number for VIDEO CDs/ CDs, album number for DATA CDs.
** Displays the index number for VIDEO CDs/ CDs, MP3 audio track number for DATA CDs.

List of Control Menu Items

Item	Item Name, Function, Relevant Disc Type
	TITLE (page 40)/SCENE (page 40)/TRACK (page 40) Selects the title, scene, or track to be played. DVD VCD
	CHAPTER (page 40)/INDEX (page 40) Selects the chapter or index to be played. DVD VCD
	ALBUM (page 33) Selects the album to be played. DATA CD
	TRACK (page 40) Selects the track to be played. CD DATA CD
	INDEX (page 40) Selects the index to be played. CD
	TIME/TEXT (page 40) Checks the elapsed time and the remaining playback time. Input the time code for picture and music searching. Displays the DVD/CD text or the DATA CD's track name. DVD VCD CD DATA CD
	AUDIO (page 50) Changes the audio setting. DVD VCD CD DATA CD
	SUBTITLE (page 53) Displays the subtitles. Changes the subtitle language. DVD
	ANGLE (page 53) Changes the angle. DVD
	TVS (TV Virtual Surround) (page 51) Selects the surround functions. DVD
	ADVANCED (page 48) Displays the information (bit rate or layer) of the disc currently playing. DVD
	PARENTAL CONTROL (page 58) Set to prohibit playback on this player. DVD VCD CD
	SETUP (page 64) QUICK Setup (page 25) Use Quick Setup to choose the desired language of the on-screen display, the aspect ratio of the TV and the audio output. CUSTOM Setup In addition to the Quick Setup setting, you can adjust other various settings. RESET Returns the settings in "SETUP" to the default setting. DVD VCD CD DATA CD
	PROGRAM (page 35) Selects the title, chapter, or track to play in the order you want. DVD VCD CD
	SHUFFLE (page 37) Plays the title, chapter, or track in random order. DVD VCD CD
	REPEAT (page 38) Plays the entire disc (all titles/all tracks/all albums) repeatedly or one title/chapter/ track/album repeatedly. DVD VCD CD DATA CD
	A-B REPEAT (page 39) Specifies the parts you want to play repeatedly. DVD VCD CD

→continued

	BNR (page 54) Adjusts the picture quality by reducing the "block noise" or mosaic like patterns that appear on your TV screen. DVD VCD
	CUSTOM PICTURE MODE (page 55) Adjusts the video signal from the player. You can select the picture quality that best suits the programme you are watching. DVD VCD
	DIGITAL VIDEO ENHANCER (page 56) Exaggerates the outline of the image to produce a sharper picture. DVD VCD
	PICTURE NAVIGATION (page 41) Divides the screen into 9 subscreens to help you find the scene you want quickly. DVD VCD

Hint
The Control Menu icon indicator lights up in green → when you select any item except "OFF." ("TVS," "PROGRAM," "SHUFFLE," "REPEAT," "A-B REPEAT," "BNR," "DIGITAL VIDEO ENHANCER" only). The "ANGLE" indicator lights up in green only when the angles can be changed. The "CUSTOM PICTURE MODE" indicator lights up in green when any setting other than "STANDARD" is selected.

Simple Start Guide

Quick Overview

A quick overview presented in this guide will give you enough information to start using the player for your enjoyment. To use the surround sound features of this player, refer to "Hookups" on page 18.

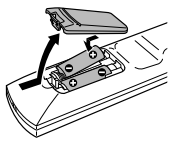
Notes
- You cannot connect this player to a TV that does not have a video input jack.
- Be sure to disconnect the power cord (mains lead) of each component before connecting.

Step 1: Unpacking

Check that you have the following items:
- Audio/video cord (pinplug × 3 ⟷ pinplug × 3) (1)
- Remote commander (remote) (1)
- Size R6 (AA) batteries (2)

Step 2: Inserting Batteries into the Remote

You can control the player using the supplied remote. Insert two size R6 (AA) batteries by matching the ⊕ and ⊖ ends on the batteries to the markings inside the compartment. When using the remote, point it at the remote sensor ▯ on the player.



Notes
- Do not leave the remote in an extremely hot or humid place.
- Do not drop any foreign object into the remote casing, particularly when replacing the batteries.
- Do not expose the remote sensor to direct light from the sun or a lighting apparatus. Doing so may cause a malfunction.
- If you do not use the remote for an extended period of time, remove the batteries to avoid possible damage from battery leakage and corrosion.

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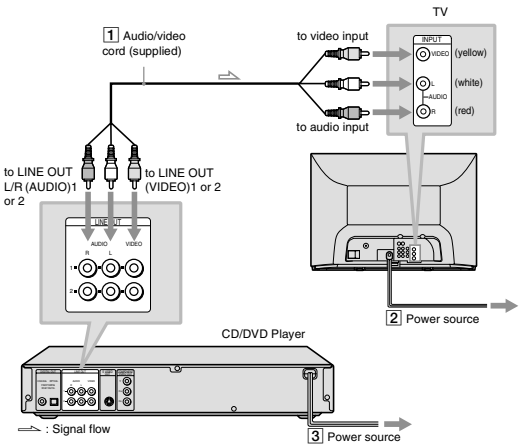
Step 3: TV Hookups

Connect the supplied audio/video cord and the power cord (mains lead) in the order (1~3) shown below. Be sure to connect the power cord (mains lead) last.



When connecting to a standard 4:3 screen TV

Depending on the disc, the image may not fit your TV screen.
If you want to change the aspect ratio, please refer to page 66.

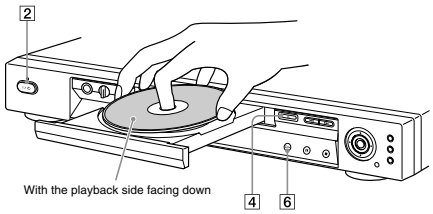
To change the colour system

The colour system of the player is set to NTSC or PAL. If the on-screen display of the player does not appear on the TV, change the colour system of the player (PAL or NTSC) so that a picture appears on your TV. To change the colour system, hold I/⏻ down for a few seconds while pressing ■ on the player.

Hints

- To check the current setting of the player's colour system, press I/⏻ on the player or remote. The power indicator lights up in green. When "NTSC" appears on the front panel display, the colour system of the player is set to NTSC. When "NTSC" does not appear, the colour system is set to PAL.
- When connecting to a monaural TV, use a stereo-mono conversion cord (not supplied). Connect the LINE OUT (VIDEO) 1/2 jacks on the player to the TV's video input jack, and connect the LINE OUT L/R (AUDIO) 1/2 jacks to the TV's audio input jack.

Step 4: Playing a Disc



1 Turn on the TV.

2 Press I/⏻ on the player.

3 Switch the input selector on your TV so that the signal from the player appears on the TV screen.

4 Press ⏏ on the player to open the disc tray.

5 Place the disc on the tray with the playback side facing down.

6 Press ▷.
The disc tray closes and the player begins playing the disc.

After Step 6

Depending on the disc, a menu may be displayed on the TV screen. If so, select the item you want from the menu and play the DVD (page 32) or VIDEO CD disc (page 32).

To stop playing

Press ■.

To remove the disc

Press ⏏.

To turn off the player

Press I/⏻. The player enters standby mode and the power indicator lights up in red.

Hooking Up the Player

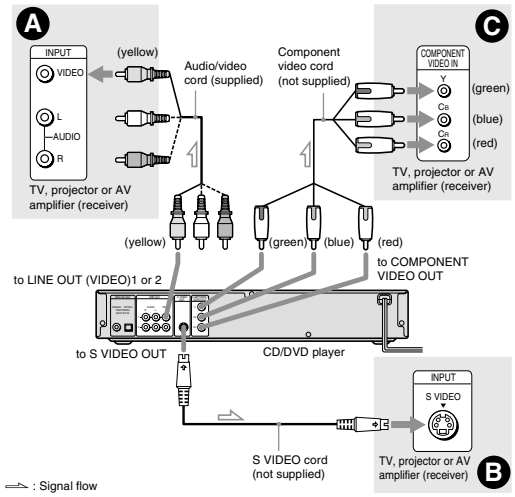
Follow Steps 1 to 4 to hook up and adjust the settings of the player.
Before you start, disconnect the power cords (mains leads), check that you have all of the supplied accessories, and insert the batteries into the remote (page 15).

Notes

- Plug cords securely to prevent unwanted noise.
- Refer to the instructions supplied with the components to be connected.

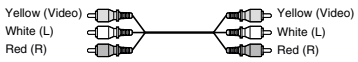
Step 1: Connecting the Video Cords

Connect this player to your TV monitor, projector, or AV amplifier (receiver) using a video cord. Select one of the patterns A through C, according to the input jack on your TV monitor, projector, or AV amplifier (receiver).



A If you are connecting to a video input jack

Connect the yellow plug of the audio/video cord (supplied) to the yellow (video) jacks. You will enjoy standard quality images.



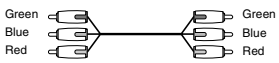
Use the red and white plugs to connect to the audio input jacks (page 21). (Do this if you are connecting to a TV only.)

B If you are connecting to an S VIDEO input jack

Connect an S VIDEO cord (not supplied). You will enjoy high quality images.

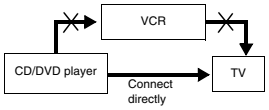
C If you are connecting to a monitor, projector, or AV amplifier (receiver) having component video input jacks (Y, CB, CR)

Connect the component via the COMPONENT VIDEO OUT jacks using a component video cord (not supplied) or three video cords (not supplied) of the same kind and length. You will enjoy accurate colour reproduction and high quality images.



Notes

- You can switch the player's colour system to match the colour system of the connected TV (page 16).
- Do not connect the player to a VCR. If you pass the player signals via the VCR, you may not receive a clear image on the TV screen. If your TV only has one audio/video input jack, connect the player to this jack.



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Step 2: Connecting the Audio Cords

Refer to the chart below to select the connection that best suits your system. Be sure to also read the instructions for the components you wish to connect.

Select a connection

Select one of the following connections, A through D.

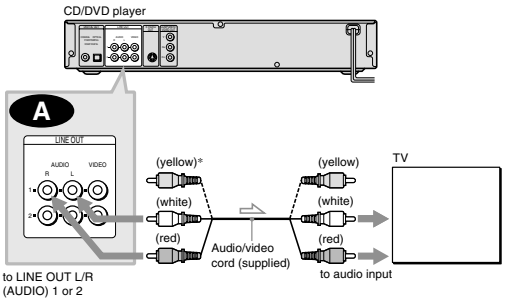
Components to be connected	Connection	Your setup
TV • Surround effects: TVS DYNAMIC (page 52), TVS WIDE (page 52)	A (page 21)	example
Stereo amplifier (receiver) and two speakers • Surround effects: TVS STANDARD (page 52) or **MD deck/DAT deck** • Surround effects: none	B (page 22)	example
AV amplifier (receiver) having a Dolby* Surround (Pro Logic) decoder and 3 to 6 speakers • Surround effects: Dolby Surround (Pro Logic) (page 74)	C (page 23)	example
AV amplifier (receiver) with a digital input jack having a Dolby Digital, MPEG audio, or DTS decoder and 6 speakers** • Surround effects: Dolby Digital (5.1ch) (page 74), DTS (5.1ch) (page 74), MPEG audio (5.1 ch) (page 74)	D (page 24)	example

* Manufactured under license from Dolby Laboratories. "Dolby," "Pro Logic," and the double-D symbol are trademarks of Dolby Laboratories.

** "DTS" and "DTS Digital Out" are trademarks of Digital Theater Systems, Inc.

A Connecting to your TV

This connection will use your TV speakers for sound.



* The yellow plug is used for video signals (page 18).

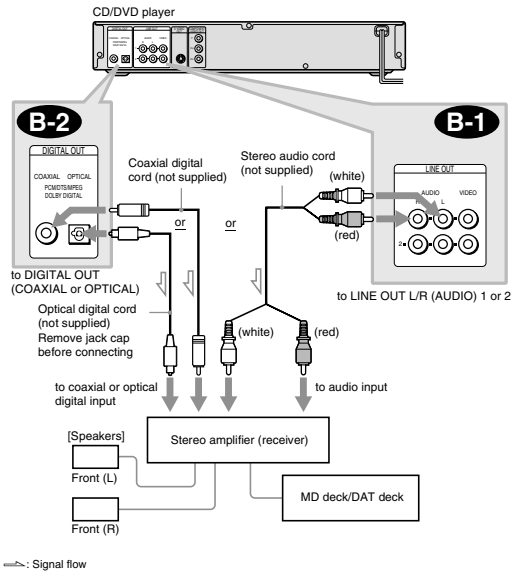
Hint

When connecting to a monaural TV, use a stereo-mono conversion cord (not supplied). Connect the LINE OUT L/R (AUDIO) 1/2 jacks to the TV's audio input jack.

→continued

B Connecting to a stereo amplifier (receiver) and 2 speakers/Connecting to an MD deck or DAT deck

If the stereo amplifier (receiver) has audio input jacks L and R only, use B-1. If the amplifier (receiver) has a digital input jack, or when connecting to an MD deck or DAT deck, use B-2. In this case, you can also connect the player directly to the MD deck or DAT deck without using your stereo amplifier (receiver).



Hint

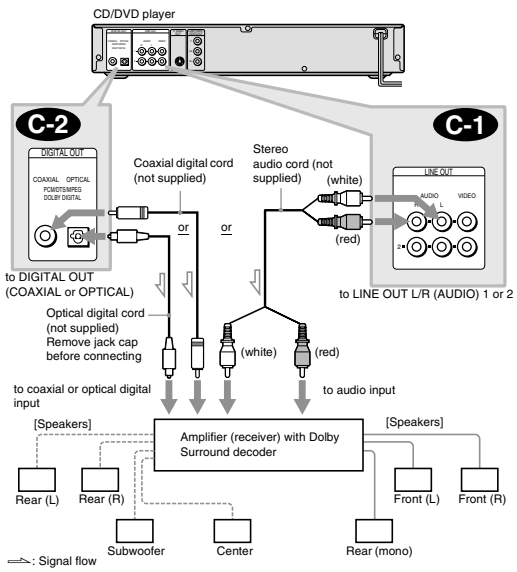
In connection B-1, you can use the supplied audio/video cord instead of using a separate stereo audio cord.

Note

If you select one of the TVS effects (page 51) while playing a disc, no sound will come from your speakers with the B-2 connection.

C Connecting to an AV amplifier (receiver) having a Dolby Surround (Pro Logic) decoder and 3 to 6 speakers

You can enjoy the Dolby Surround effects only when playing Dolby Surround audio or multi-channel audio (Dolby Digital) discs.
If your amplifier (receiver) has L and R audio input jacks only, use C-1. If your amplifier (receiver) has a digital input jack, use C-2.



Note

When connecting 6 speakers, replace the monaural rear speaker with a center speaker, 2 rear speakers and a subwoofer.

→continued

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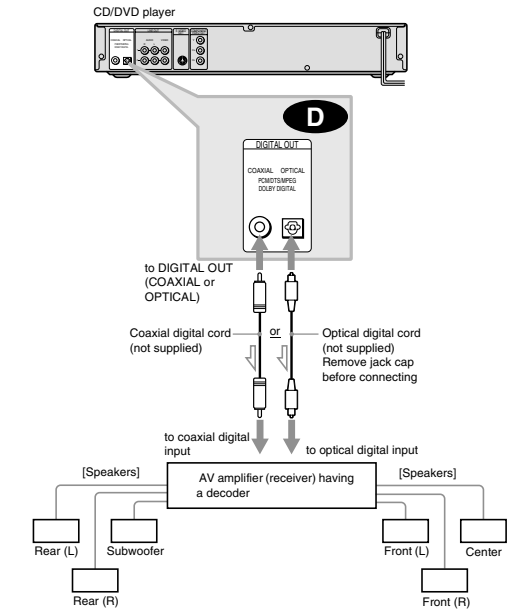
D Connecting to an AV amplifier (receiver) with a digital input jack having a Dolby Digital, MPEG audio or DTS decoder and 6 speakers

This connection will allow you to use the Dolby Digital, MPEG audio or DTS decoder function of your AV amplifier (receiver). You are unable to enjoy the surround sound effects of this player.



: Signal flow

Note

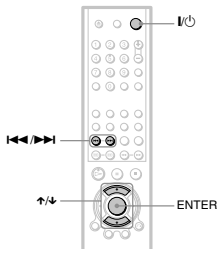
After you have completed the connection, be sure to set "DOLBY DIGITAL" to "DOLBY DIGITAL" and "DTS" to "ON" in Quick Setup (page 25). If your AV amplifier (receiver) has an MPEG audio decoder function, set "MPEG" to "MPEG" (page 70).

Step 3: Connecting the Power Cord

Plug the player and TV power cords into an AC outlet (mains).

Step 4: Quick Setup

Follow the steps below to make the minimum number of basic adjustments for using the player. To skip an adjustment, press ▶▶|. To return to the previous adjustment, press |◀◀.



1 Turn on the TV.

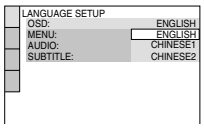
2 Press I/⏻.

3 Switch the input selector on your TV so that the signal from the player appears on the TV screen.

"Press [ENTER] to run QUICK SETUP" appears at the bottom of the screen. If this message does not appear, select "QUICK" under "SETUP" in the Control Menu to run Quick Setup (page 65).

4 Press ENTER without inserting a disc.

The Setup Display for selecting the language used in the on-screen display appears.

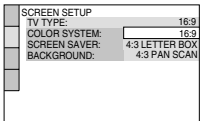


5 Press ↑/↓ to select a language.

The player uses the language selected here to display the menu and subtitles as well.

6 Press ENTER.

The Setup Display for selecting the aspect ratio of the TV to be connected appears.



7 Press ↑/↓ to select the setting that matches your TV type.

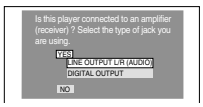
◆ If you have a wide-screen TV or a 4:3 standard TV with a wide-screen mode
- 16:9 (page 66)

◆ If you have a 4:3 standard TV
- 4:3 LETTER BOX or 4:3 PAN SCAN (page 66)

8 Press ENTER.

The Setup Display for selecting the type of jack used to connect your amplifier (receiver) appears.

➡continued


Is this player connected to an amplifier (receiver) ? Select the type of jack you are using.
YES
LINE OUTPUT L/R (AUDIO)
DIGITAL OUTPUT
NO

9 Press ↑/↓ to select the type of jack (if any) you are using to connect to an amplifier (receiver), then press ENTER.

Choose the item that matches the audio connection you selected on pages 21 to 24 (A through D).

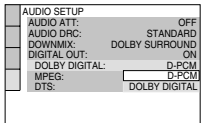
A
- If you connect just a TV and nothing else, select "NO." Quick Setup is finished and connections are complete.

B-1 C-1
- Select "LINE OUTPUT L/R (AUDIO)." Quick Setup is finished and connections are complete.

B-2 C-2 D
- Select "DIGITAL OUTPUT." The Setup Display for "DOLBY DIGITAL" appears.

10 Press ↑/↓ to select the type of Dolby Digital signal you wish to send to your amplifier (receiver).

Choose the signal that matches the audio connection you selected on pages 22 to 24 (B through D).

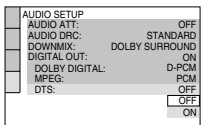


B-2 C-2
- D-PCM (page 70)

D
- DOLBY DIGITAL (only if the amplifier (receiver) has a Dolby Digital decoder) (page 70)

11 Press ENTER.

"DTS" is selected.



12 Press ↑/↓ to select whether or not you wish to send a DTS signal to your amplifier (receiver).

Choose the item that matches the audio connection you selected on pages 22 to 24 (B through D).

B-2 C-2
- OFF (page 70)

D
- ON (only if the amplifier (receiver) has a DTS decoder) (page 70)

13 Press ENTER.

Quick Setup is finished. All connections and setup operations are complete. If your AV amplifier (receiver) has an MPEG audio decoder, adjust the "MPEG" setting (page 70).

Enjoying the surround sound effects

To enjoy the surround sound effects of this player or your amplifier (receiver), set the following items as described below for the audio connection you selected on pages 22 to 24 (B through D). Each of these is the default setting and does not need to be adjusted when you first connect the player. Refer to page 64 for using the Setup Display.

Audio Connection (pages 21 to 24)

A
- No additional settings are needed.

B-1 C-1
- Set "DOWNMIX" to "DOLBY SURROUND" (page 69)
- If the sound distorts even when the volume is turned down, set "AUDIO ATT" to "ON" (page 69)

B-2 C-2 D
- Set "DOWNMIX" to "DOLBY SURROUND" (page 69)
- Set "DIGITAL OUT" to "ON" (page 69)

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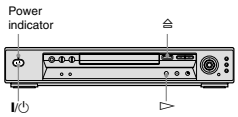
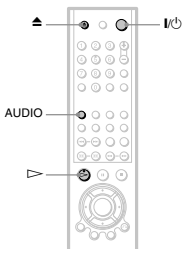
Playing Discs DVD VCD CD DATA CD

Depending on the DVD or VIDEO CD, some operations may be different or restricted. Refer to the operating instructions supplied with your disc.





1 Turn on your TV.

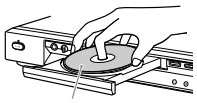
2 Press I/⏻.

The player turns on and the power indicator lights up in green.

3 Switch the input selector on your TV so that the signal from the player appears on the TV screen.

◆ When using an amplifier (receiver)
Turn on the amplifier (receiver) and select the appropriate channel so that you can hear sound from the player.

4 Press ⏏ on the player, and place a disc on the disc tray.



With the playback side facing down

5 Press ▷.

The disc tray closes, and the player starts playback (continuous play). Adjust the volume on the TV or the amplifier (receiver).
Depending on the disc, a menu may appear on the TV screen. For DVDs, see page 32. For VIDEO CDs, see page 32.

To turn off the player

Press I/⏻. The player enters standby mode.

Hint
The player will turn off automatically whenever you leave it in stop mode for more than 30 minutes (Auto Power off function).

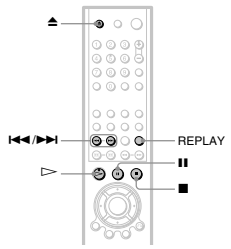
Notes on playing DTS sound tracks on a CD

- When playing DTS-encoded CDs, excessive noise will be heard from the analog stereo jacks. To avoid possible damage to the audio system, the consumer should take proper precautions when the analog stereo jacks of the player are connected to an amplification system. To enjoy DTS Digital Surround™ playback, an external 5.1-channel decoder system must be connected to the digital jack of the player.
- Set the sound to "STEREO" using the AUDIO button when you play DTS sound tracks on a CD (page 50).
- Do not play DTS sound tracks without first connecting the player to an audio component having a built-in DTS decoder. The player outputs the DTS signal via the DIGITAL OUT (COAXIAL or OPTICAL) jack even if "DTS" in "AUDIO SETUP" is set to "OFF" in the Setup Display (page 70), and may affect your ears or cause your speakers to be damaged.

Notes on playing DVDs with a DTS sound track

- DTS audio signals are output only through the DIGITAL OUT (COAXIAL or OPTICAL) jack.
- When you play a DVD with DTS sound tracks, set "DTS" to "ON" in "AUDIO SETUP" (page 70).
- If you connect the player to audio equipment without a DTS decoder, do not set "DTS" to "ON" in "AUDIO SETUP" (page 70). A loud noise may come out from the speakers, affecting your ears or causing the speakers to be damaged.

Additional operations



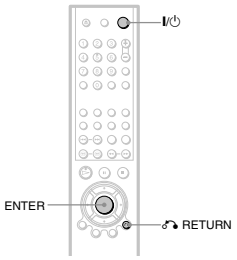
To	Operation
Stop	Press ■
Pause	Press II
Resume play after pause	Press II or ▷
Go to the next chapter, track, or scene in continuous play mode	Press ▶▶I
Go back to the previous chapter, track, or scene in continuous play mode	Press I◀◀
Stop play and remove the disc	Press ⏏
Replay the previous scene (DVD only)	Press REPLAY

Hint
The Replay function is useful when you want to review a scene or dialog that you missed.

Note
You may not be able to use the Replay function with some scenes.

Locking the disc tray (Child Lock)

You can lock the disc tray to prevent children from opening it.



When the player is in standby mode, press RETURN, ENTER, and then I/⏻ on the remote.
The player turns on and "LOCKED" appears on the front panel display.
The ⏏ button on the player or the remote does not work while the Child Lock is set.

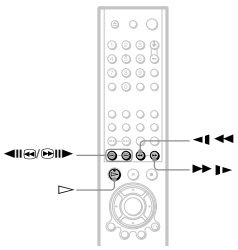
To unlock the disc tray

When the player is in standby mode, press RETURN, ENTER, and then I/⏻ again.

Note
Even if you select "RESET" under "SETUP" in the Control Menu (page 65), the disc tray remains locked.

Searching for a Particular Point on a Disc (Search, Scan, Slow-motion Play, Freeze Frame)

You can quickly locate a particular point on a disc by monitoring the picture or playing back slowly.



Note
Depending on the DVD/VIDEO CD, you may not be able to do some of the operations described.

Locating a point quickly (Search) DVD VCD CD DATA CD

During playback, keep pressing ⏩II▶ to locate a point in the playback direction or keep pressing ◀II⏪ to locate a point in the opposite direction. When you find the point you want, release the button to return to normal playback speed.

Locating a point quickly by playing a disc in fast forward or fast reverse (Scan) DVD VCD CD DATA CD

Press ◀I ◀◀ or ▶▶ I▶ while playing a disc. When you find the point you want, press ▷ to return to normal speed. Each time you press ◀I ◀◀ or ▶▶ I▶ during scan, the playback speed changes. Three speeds are available. With each press the indication changes as follows:

Playback direction
×2▶ (DVD/CD only) → FF 1▶▶ → FF 2▶▶

Opposite direction
×2◀ (DVD only) → FR 1◀◀ → FR 2◀◀

The "×2▶"/"×2◀" playback speed is about twice the normal speed. The "FF 2▶▶"/"FR 2◀◀" playback speed is faster than "FF 1▶▶"/"FR 1◀◀."

Watching frame by frame (Slow-motion play) DVD VCD

Press ◀I ◀◀ or ▶▶ I▶ when the player is in pause mode. To return to the normal speed, press ▷.
Each time you press ◀I ◀◀ or ▶▶ I▶ during Slow-motion play, the playback speed changes. Two speeds are available. With each press the indication changes as follows:

Playback direction
SLOW 2 I▶ ⟷ SLOW 1 I▶

Opposite direction (DVD only)
SLOW 2 ◀I ⟷ SLOW 1 ◀I

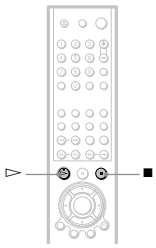
The "SLOW 2 I▶"/"SLOW 2 ◀I" playback speed is slower than "SLOW 1 I▶"/"SLOW 1 ◀I."

Playing one frame at a time (Freeze Frame) DVD VCD

When the player is in the pause mode, press ⏩II▶ to go to the next frame. Press ◀II⏪ to go to the preceding frame (DVD only). If you hold the button down, you can view the frames in succession. To return to normal playback, press ▷.

Resuming Playback from the Point Where You Stopped the Disc (Multi-disc Resume) DVD VCD

The player stores the point where you stopped the disc for up to 40 discs and resumes playback the next time you insert the same disc. When you store a resume playback point for the 41st disc, the resume playback point for the first disc is deleted.



1 While playing a disc, press ■ to stop playback.

"RESUME" appears on the front panel display.

2 Press ▷.

The player starts playback from the point where you stopped the disc in Step 1.

Hints
- To play from the beginning of the disc, press ■ twice, then press ▷.
- For CDs and DATA CDs, the player remembers the resume playback point for the current disc unless the disc tray is opened, the AC power cord (mains lead) is disconnected, or only for DATA CDs, the player enters standby mode.

Notes
- "MULTI-DISC RESUME" in "CUSTOM SETUP" must be set to "ON" (default) for this function to work (page 68).
- The resume playback point for the current disc is cleared when:
  – you change the play mode.
  – you change the settings on the Setup Display.
- Resume Play does not work during Shuffle Play and Programme Play.
- This function may not work with some discs.

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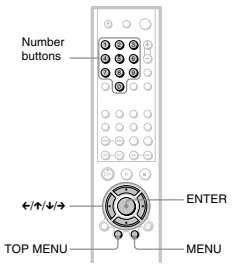
Using the DVD's Menu DVD

A DVD is divided into long sections of a picture or a music feature called "titles."
When you play a DVD which contains several titles, you can select the title you want using the TOP MENU button.
When you play DVDs that allow you to select items such as the language for the subtitles and the language for the sound, select these items using the MENU button.



1 Press TOP MENU or MENU.

The disc's menu appears on the TV screen.
The contents of the menu vary from disc to disc.

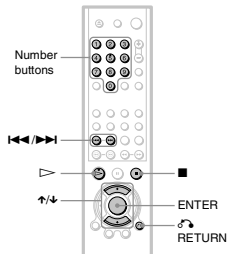
2 Press ←/↑/↓/→ or the number buttons to select the item you want to play or change.

3 Press ENTER.

Hint
The disc's menu also appears when the TOP MENU or MENU button on the player is pressed.

Playing VIDEO CDs with PBC Functions (PBC Playback) VCD

PBC (Playback Control) allows you to play VIDEO CDs interactively by following the menu on the TV screen.



1 Start playing a VIDEO CD with PBC functions.

The menu for your selection appears.

2 Select the item number you want by pressing ↑/↓ or the number buttons.

3 Press ENTER.

4 Follow the instructions in the menu for interactive operations.

Refer to the instructions supplied with the disc, as the operating procedure may differ depending on the VIDEO CD.

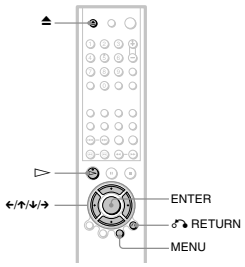
To return to the menu
Press RETURN.

Hint
To play without using PBC, press I◄◄/►►I or the number buttons while the player is stopped to select a track, then press ▻ or ENTER.
"Play without PBC" appears on the TV screen and the player starts continuous play. You cannot play still pictures such as a menu.
To return to PBC playback, press ■ twice then press ▻.

Notes
- Depending on the VIDEO CD, "Press ENTER" in Step 3 may appear as "Press SELECT" in the instructions supplied with the disc. In this case, press ▻.
- The PBC functions of Super VCDs do not work with this player. Super VCDs are played in continuous play mode only.

Playing an MP3 Audio Track DATA CD

You can play back DATA CDs (CD-ROMs/CD-Rs/CD-RWs) recorded in MP3 (MPEG1 Audio Layer 3) format.



1 Press ⏏ and place a DATA CD on the disc tray.

2 Press ▻.

The disc tray closes, and the player starts to play the first MP3 audio track in the first album on the disc.

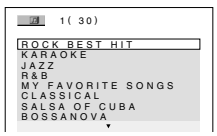
Notes
- The player can play MP3 audio tracks recorded in the following sampling frequencies: 32kHz, 44.1kHz, 48kHz.
- The playback order may be different from the edited order. See "The Playback order of MP3 audio tracks" below for details.

Selecting an album and track

1 Press MENU.

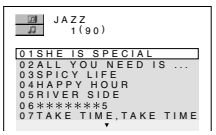
The list of MP3 albums recorded on the DATA CD appears.

➡continued



2 Select an album using ↑/↓ and press ENTER.

The list of tracks contained in the album appears.



3 Select a track using ↑/↓ and press ENTER.

The selected track starts playing.
When a track or album is being played, its title is shaded.

To go to the next or previous page
Press → or ←.

To return to the previous display
Press RETURN.

To turn off the display
Press MENU.

Notes
- Only the letters in the alphabet and numbers can be used for album or track names. Anything else is displayed as "*."
- ID3 tags cannot be displayed.

About MP3 audio tracks

You can play MP3 audio tracks on CD-ROMs, CD-Rs, or CD-RWs. However, the discs must be recorded according to ISO9660 level 1, level 2, or Joliet format for the player to recognize the tracks.
You can also play discs recorded in Multi Session.

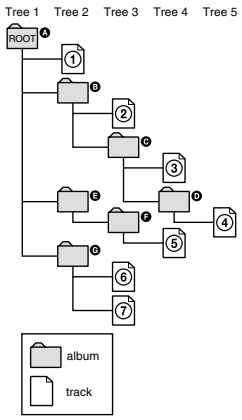
See the instructions of the CD-R/RW device or recording software (not supplied) for details on the recording format.

To play a Multi Session CD
This player can play Multi Session CDs when an MP3 audio track is located in the first session. Any subsequent MP3 audio tracks, recorded in the later sessions, can also be played back.
When audio tracks and images in music CD format or video CD format are recorded in the first session, only the first session will be played back.

Notes
- If you put the extension ".MP3" to data not in MP3 format, the player cannot recognize the data properly and will generate a loud noise which could damage your speaker system.
- The player cannot play audio tracks in MP3PRO format.

The Playback order of MP3 audio tracks
The playback order of albums and tracks recorded on a DATA CD is as follows.

◆Structure of disc contents



When you insert a DATA CD and press ▻, the numbered tracks are played sequentially, from ① through ⑦. Any sub-albums/tracks contained within a currently selected album take priority over the next album in the same tree. (Example: Ⓒ contains Ⓓ so ④ is played before ⑤.)
When you press MENU and the list of MP3 albums appears (page 33), the albums are arranged in the following order: Ⓐ → Ⓑ → Ⓒ → Ⓓ → Ⓕ → Ⓒ. Albums that do not contain tracks (such as album Ⓔ) do not appear in the list.

Hints
- If you add numbers (01, 02, 03, etc.) to the front of the track file names, the tracks will be played in that order.
- Since a disc with many trees takes longer to start playback, it is recommended that you create albums of no more than two trees.

Notes
- Depending on the software you use to create the DATA CD, the playback order may differ from the illustration above.
- The playback order above may not be applicable if there are more than a total of 200 albums and tracks in the DATA CD.
- The player can recognize up to 100 albums (the player will count just albums, including albums that do not contain MP3 audio tracks). The player will not play any albums beyond the first 100 albums. Of the first 100 albums, the player will play no more than a combined total of 200 albums and tracks.

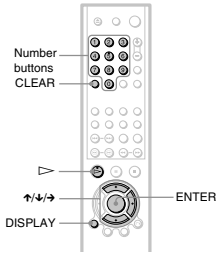
Various Play Mode Functions (Programme Play, Shuffle Play, Repeat Play, A-B Repeat Play)

You can set the following play modes:
- Programme Play (page 35)
- Shuffle Play (page 37)
- Repeat Play (page 38)
- A-B Repeat Play (page 39)

Note
The play mode is cancelled when:
– you open the disc tray.
– the player enters standby mode by pressing I/⏻.

Creating your own programme (Programme Play) DVD VCD CD

You can play the contents of a disc in the order you want by arranging the order of the titles, chapters, or tracks on the disc to create your own programme. You can programme up to 99 titles, chapters, and tracks.



➡continued

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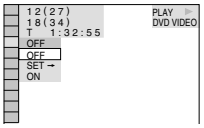
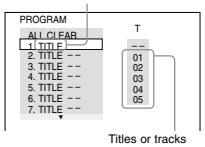
1 Press DISPLAY twice (when playing a CD, press once).
The Control Menu appears.

2 Press ↑/↓ to select (PROGRAM), then press ENTER.
The options for "PROGRAM" appear.



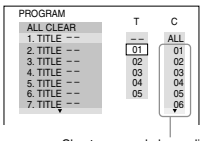
3 Press ↑/↓ to select "SET →," then press ENTER.

"TRACK" is displayed when you play a VIDEO CD or CD.



Titles or tracks recorded on a disc

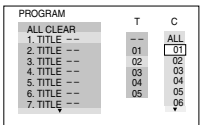
4 Press →.
The cursor moves to the title or track row "T" (in this case, "01").



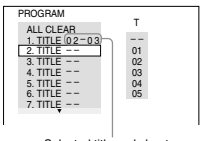
Chapters recorded on a disc

5 Select the title, chapter, or track you want to programme.

◆ When playing a DVD
For example, select chapter "03" of title "02."
Press ↑/↓ or the number buttons to select "02" under "T," then press ENTER.



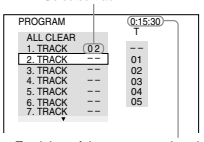
Next, press ↑/↓ or the number buttons to select "03" under "C," then press ENTER.



Selected title and chapter

◆ When playing a VIDEO CD or CD
For example, select track "02."
Press ↑/↓ or the number buttons to select "02" under "T," then press ENTER.

Selected track



Total time of the programmed tracks

6 To programme other titles, chapters, or tracks, repeat Steps 4 to 5.
The programmed titles, chapters, and tracks are displayed in the selected order.

7 Press ▷ to start Programme Play.
Programme Play begins.
When the programme ends, you can restart the same programme again by pressing ▷.

To return to normal play
Press CLEAR, or select "OFF" in Step 3. To play the same programme again, select "ON" in Step 3 and press ENTER.

To turn off the display
Press DISPLAY repeatedly until the display is turned off.

To change or cancel a programme

1 Follow Steps 1 and 3 of "Creating your own programme (Programme Play)."

2 Select the programme number of the title, chapter, or track you want to change or cancel using ↑/↓ or the number buttons, and press →.

3 Follow Step 5 for new programming. To cancel a programme, select "--" under "T," then press ENTER.

To cancel all the titles, chapters, or tracks in the programmed order

1 Follow Steps 1 through 3 of "Creating your own programme (Programme Play)."

2 Press ↑ and select "ALL CLEAR."

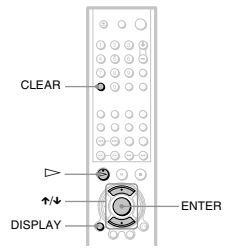
3 Press ENTER.

Hint
You can do Repeat Play or Shuffle Play of the programmed titles, chapters, or tracks. During Programme Play, follow the Steps of "Repeat Play" (page 38) or "Shuffle Play" (page 37).

Note
When playing Super VCDs, the total time of the programmed tracks does not appear on the screen.

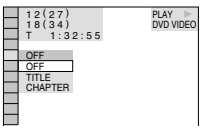
Playing in random order (Shuffle Play) DVD VCD CD

You can have the player "shuffle" titles, chapters, or tracks. Subsequent "shuffling" may produce a different playing order.



1 Press DISPLAY twice during playback (when playing a CD, press once).
The Control Menu appears.

2 Press ↑/↓ to select (SHUFFLE), then press ENTER.
The options for "SHUFFLE" appear.



3 Press ↑/↓ to select the item to be shuffled.

◆ When playing a DVD
• TITLE
• CHAPTER

◆ When playing a VIDEO CD or CD
• TRACK

◆ When Programme Play is activated
• ON: shuffles titles, chapters, or tracks selected in Programme Play.

→continued

4 Press ENTER.
Shuffle Play starts.

To return to normal play
Press CLEAR, or select "OFF" in Step 3.

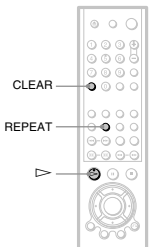
To turn off the Control Menu
Press DISPLAY repeatedly until the Control Menu is turned off.

Hints
• You can set Shuffle Play while the player is stopped. After selecting the "SHUFFLE" option, press ▷. Shuffle Play starts.
• Up to 200 chapters in a disc can be played in random order when "CHAPTER" is selected.

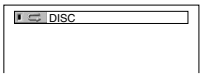
Playing repeatedly (Repeat Play)

DVD VCD CD DATA CD

You can play all of the titles or tracks on a disc or a single title, chapter, or track repeatedly.
You can use a combination of Shuffle or Programme Play modes.



1 Press REPEAT during playback.
The following display appears.



2 Press REPEAT repeatedly to select the item to be repeated.

◆ When playing a DVD
• DISC: repeats all of the titles.
• TITLE: repeats the current title on a disc.
• CHAPTER: repeats the current chapter.

◆ When playing a VIDEO CD or CD
• DISC: repeats all of the tracks.
• TRACK: repeats the current track.

◆ When playing a DATA CD (MP3 audio)
• DISC: repeats all of the albums.
• ALBUM: repeats the current album.
• TRACK: repeats the current track.

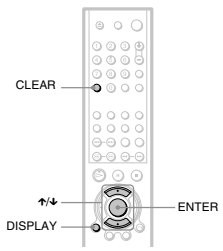
◆ When Programme Play or Shuffle Play is activated
• ON: repeats Programme Play or Shuffle Play.

To return to normal play
Press CLEAR, or select "OFF" in Step 2.

Hints
• You can set Repeat Play while the player is stopped. After selecting the "REPEAT" option, press ▷. Repeat Play starts.
• You can also select "REPEAT" from the Control Menu (page 12).

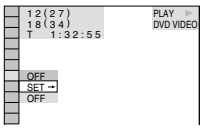
Repeating a specific portion (A-B Repeat Play) DVD VCD CD

You can play a specific portion of a title, chapter or track repeatedly. (This function is useful when you want to memorize lyrics, etc.)

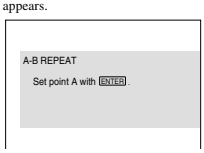


1 Press DISPLAY twice during playback (when playing a CD, press once).
The Control Menu appears.

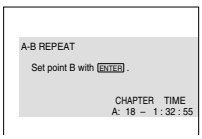
2 Press ↑/↓ to select (A-B REPEAT), then press ENTER.
The options for "A-B REPEAT" appear.



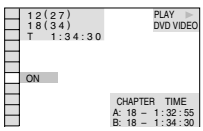
3 Press ↑/↓ to select "SET →," then press ENTER.
The "A-B REPEAT" setting display appears.



4 During playback, when you find the starting point (point A) of the portion to be played repeatedly, press ENTER.
The starting point (point A) is set.



5 When you reach the ending point (point B), press ENTER again.
The set points are displayed and the player starts repeating this specific portion.
"A-B" appears on the front panel display during A-B Repeat Play.



To return to normal play
Press CLEAR, or select "OFF" in Step 3.

To turn off the Control Menu
Press DISPLAY repeatedly until the Control Menu is turned off.

Notes
• You can set A-B Repeat Play for only one specific section.
• When you set A-B Repeat Play, the settings for Shuffle Play, Repeat Play, and Programme Play are cancelled.

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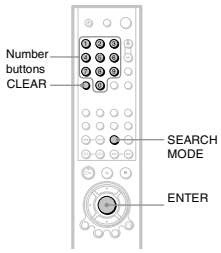
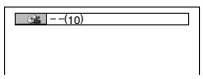
Searching for a Title/ Chapter/Track/Index/ Scene (Search mode) DVD VCD CD DATA CD

You can search a DVD by title or chapter, and you can search a VIDEO CD/CD by track, index, or scene. As titles and tracks are assigned unique numbers on the disc, you can select the desired one by entering its number. Or, you can search for a scene using the time code.



1 Press SEARCH MODE.

The following display appears.
"-- (**)" appears next to the icon (** refers to a number).
The number in parentheses indicates the total number of titles, tracks, indexes, scenes, etc. of the disc.



2 Press SEARCH MODE repeatedly to select the search method.

◆ **When playing a DVD**
TITLE
CHAPTER
TIME/TEXT
Select "TIME/TEXT" to search for a starting point by inputting the time code.

◆ **When playing a VIDEO CD**
TRACK
INDEX

◆ **When playing a VIDEO CD with PBC Playback**
SCENE
INDEX

◆ **When playing a CD**
TRACK
INDEX

◆ **When playing a DATA CD (MP3 audio)**
ALBUM
TRACK

3 Select the number of the title, track, scene, time code, etc. you want by pressing the number buttons to select the digit.

For example, to find the scene at 2 hours, 10 minutes, and 20 seconds after the beginning, select "TIME/TEXT" in Step 2 and enter "2:10:20."

If you make a mistake
Cancel the number by pressing CLEAR, then select another number.

4 Press ENTER.

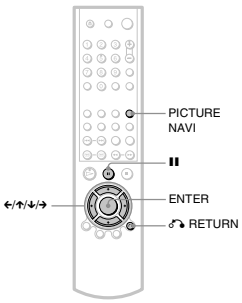
The player starts playback from the selected number.

To turn off the display
Press SEARCH MODE repeatedly until the display is turned off.

Hints
- You can display the first scene of titles, chapters or tracks recorded on the disc on a screen divided into 9 sections. You can start playback directly by selecting one of the scenes. For details, see page 41.
- You can also select "TITLE," "CHAPTER," "TRACK," "INDEX," "SCENE," "TIME/TEXT," or "ALBUM" from the Control Menu (page 12).

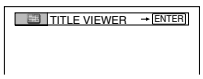
Searching by Scene (PICTURE NAVIGATION)

You can divide the screen into 9 subscreens and find the desired scene quickly.



1 Press PICTURE NAVI during playback.

The following display appears.



2 Press PICTURE NAVI repeatedly to select the item.

Refer to the explanations given for each item in the following sections.
- TITLE VIEWER (for DVD only)
- CHAPTER VIEWER (for DVD only)
- TRACK VIEWER (for VIDEO CD only)
- STROBE PLAYBACK
- ANGLE VIEWER (for DVD only)

3 Press ENTER.

➡continued

To return to normal play
Press RETURN.

Hint
You can also select "PICTURE NAVIGATION" from the Control Menu (page 12).

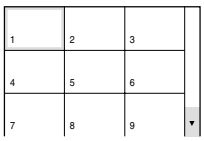
Notes
- The "PICTURE NAVIGATION" is not available when playing Super VCDs.
- Depending on the disc, you may not be able to select all functions.
- The sound is muted when using this function.

Scanning the title, chapter, or track (TITLE VIEWER, CHAPTER VIEWER, TRACK VIEWER) DVD VCD

You can divide the screen into 9 subscreens and display the first scene of titles, chapters, or tracks.

You can also play back from the selected title, chapter, or track. After performing Step 3 of "Searching by Scene" above, select the scene using ←/↑/↓/→ and press ENTER.

Hint
If there are more than 9 titles, chapters, or tracks, ▼ is displayed at the bottom right.
To display the additional titles, chapters, or tracks, select the bottom right scene (the position 9) and press ↓. To return to the previous scene, select the top left scene (the position 1) and press ↑.



Dividing a scene into 9 sections (STROBE PLAYBACK) DVD VCD

You can display 9 consecutive moving pictures on the screen.

When you press ❚❚ after performing Step 3 of "Searching by Scene" above, the moving pictures pause.

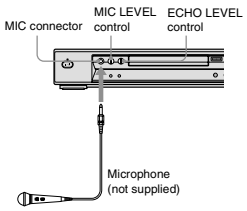
Displaying different angles simultaneously (ANGLE VIEWER) DVD

If various angles (multi-angles) for a scene are recorded on the DVD, you can display all of the angles recorded on the disc on the screen divided into 9 sections.

You can also play back from the selected angle. After performing Step 3 of "Searching by Scene" above, select the angle using ←/↑/↓/→ and press ENTER.

Using Karaoke

You can enjoy karaoke (singing along with a disc) by connecting a microphone (not supplied) to the player.



Adjusting the microphone

1 Set the MIC LEVEL control of the MIC connector to MIN.

2 Plug a microphone (not supplied) into the MIC connector.

3 Set the ON/OFF switch on the microphone to ON and turn the MIC LEVEL control to adjust the microphone volume.

4 Turn the ECHO LEVEL control to adjust the echo.

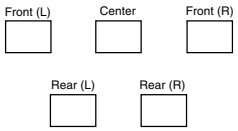
Hint
If howling occurs:
– move the microphone away from the speakers.
– lower the MIC LEVEL or ECHO LEVEL.
– lower the overall volume.

Note
The sound input from the microphone is not output from the DIGITAL OUT (OPTICAL and COAXIAL) connectors.

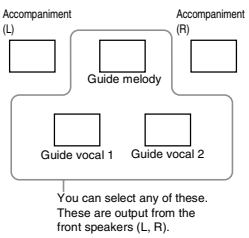
Dolby Digital Karaoke format DVD

Dolby Digital format, which reproduces surround sound using 5 channels, contains the "Dolby Digital Karaoke" format specialized for karaoke. In the Dolby Digital Karaoke format discs, guide melody and guide vocal tracks are recorded in addition to the accompaniment.

Speaker output in normal Dolby Digital format (5 channel surround)



Speaker output in Dolby Digital Karaoke format


Accompaniment (L)
Accompaniment (R)
Guide melody
Guide vocal 1
Guide vocal 2
You can select any of these. These are output from the front speakers (L, R).

You can check the audio information using "AUDIO" in the Control Menu display (page 12). When playing a Dolby Digital Karaoke disc, "♪ KARAOKE" appears at the current audio format (page 50).

➡continued

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Example:

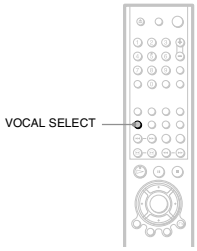
DOLBY DIGITAL 3 / 2
♪KARAOKE

2/0: Recorded only with accompaniment.
3/0: Recorded with guide melody.
3/1: Recorded with guide melody and guide vocal.
3/2: Recorded with guide melody and two kinds of guide vocals.

Selecting the Vocals (Vocal Select)

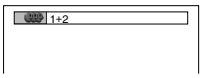
DVD VCD CD

You can change the guide vocal channel and select different kinds of vocals.



1 Press VOCAL SELECT during playback.

The following display appears.



2 Press VOCAL SELECT repeatedly to select the desired vocal channel.

The output channel changes as follows. The default setting is underlined.

◆ When playing a DVD

OFF
↓
1+2 (Guide vocal 1+2)
↓
1 (Guide vocal 1)
↓
2 (Guide vocal 2)

◆ When playing a VIDEO CD or CD

STEREO (The standard stereo sound)
↓
1/L (The sound of the left channel (monaural))
↓
2/R (The sound of the right channel (monaural))

◆ When playing a Super VCD

1:STEREO (The stereo sound of the audio track 1)
↓
1:1/L (The sound of the left channel of the audio track 1 (monaural))
↓
1:2/R (The sound of the right channel of the audio track 1 (monaural))
↓
2:STEREO (The stereo sound of the audio track 2)
↓
2:1/L (The sound of the left channel of the audio track 2 (monaural))
↓
2:2/R (The sound of the right channel of the audio track 2 (monaural))

Hints

- The channel returns to the default setting when:
  – you turn off the power.
  – you remove the disc.
- When playing a DVD recorded only with one kind of guide vocal, select "OFF" or "1."

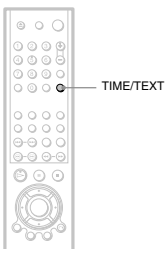
Notes

- When playing a DVD, the function works only with the Dolby Digital Karaoke format.
- If you select a channel other than "OFF" when playing a DVD, the guide melody is also output.
- Depending on the discs, you may not be able to do the operations above.

Viewing Information About the Disc

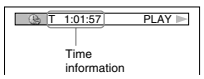
Checking the Playing Time and Remaining Time DVD VCD CD DATA CD

You can check the playing time and remaining time of the current title, chapter, or track. Also, you can check the DVD/CD text or track name (MP3 audio) recorded on the disc.



1 Press TIME/TEXT during playback.

The following display appears.



2 Press TIME/TEXT repeatedly to change the time information.

The display and the kinds of time that you can change depend on the disc you are playing.

◆ When playing a DVD

- T **:**:**
  Playing time of the current title
- T–**:**:**
  Remaining time of the current title
- C **:**:**
  Playing time of the current chapter
- C–**:**:**
  Remaining time of the current chapter

◆ When playing a VIDEO CD (with PBC functions)

- **:**
  Playing time of the current scene

◆ When playing a VIDEO CD (without PBC functions) or CD

- T **:**
  Playing time of the current track
- T–**:**
  Remaining time of the current track
- D **:**
  Playing time of the current disc
- D–**:**
  Remaining time of the current disc

◆ When playing a Super VCD

The remaining time cannot be displayed.

- T **:**
  Playing time of the current track

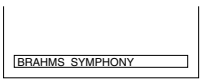
◆ When playing a DATA CD (MP3 audio)

- ****:**
  Playing time of the current track

To check the DVD/CD text or track and album names (MP3 audio)

Press TIME/TEXT repeatedly in Step 2 to display text recorded on the DVD/CD/DATA CD.

The DVD/CD text appears only when text is recorded in the disc. You cannot change the text. If the disc does not contain text, "NO TEXT" appears.

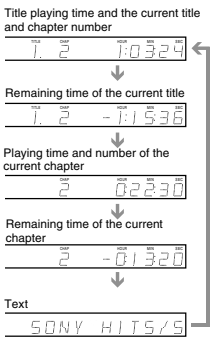


For DATA CDs, the track and album names of the MP3 audio track appears (page 49).

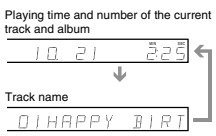
Checking the information on the front panel display

You can view the time information and text displayed on the TV screen also on the front panel display. The information on the front panel display changes as follows when you change the time information on your TV screen.

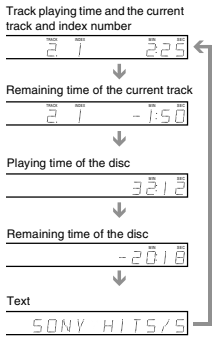
When playing a DVD


Title playing time and the current title and chapter number
Remaining time of the current title
Playing time and number of the current chapter
Remaining time of the current chapter
Text

When playing a DATA CD (MP3 audio)



When playing a VIDEO CD (without PBC functions) or CD


Track playing time and the current track and index number
Remaining time of the current track
Playing time of the disc
Remaining time of the disc
Text

Hints

- When playing VIDEO CDs with PBC functions, the scene number and the playing time are displayed.
- Long text that does not fit in a single line will scroll across the front panel display.
- You can also check the time information and text using the Control Menu (page 12).

Notes

- Depending on the type of disc being played, the DVD/CD text or track name may not be displayed.
- The player can only display the first level of the DVD/CD text, such as the disc name or title.
- Playing time of MP3 audio tracks may not be displayed correctly.

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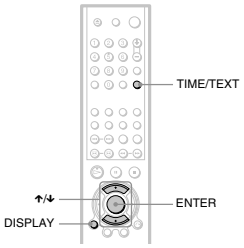
Checking the Play Information

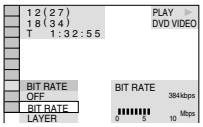
You can check information such as the bit rate or the disc layer that is being played.



Checking the play information of a DVD (ADVANCED) DVD

1 Press DISPLAY during playback.
The Control Menu is displayed.

2 Press ↑/↓ to select (ADVANCED), then press ENTER.
The options for "ADVANCED" appear.



3 Press ↑/↓ to select items.
For each item, please refer to "Displays of each item."
- BIT RATE: displays the bit rate.
- LAYER: displays the layer and the pick-up point.

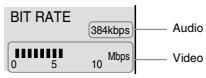
4 Press ENTER.

To close the ADVANCED window
Select "OFF" in Step 3.

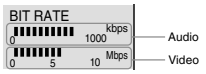
To turn off the Control Menu
Press DISPLAY repeatedly until the Control Menu is turned off.

Displays of each item
By pressing DISPLAY repeatedly, you can display either "BIT RATE" or "LAYER," whichever was selected in "ADVANCED."

◆BIT RATE

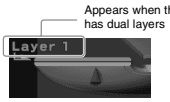


When playing MPEG audio sound tracks



Bit rate refers to the amount of video/audio data per second in a disc. While playing a disc, an approximate bit rate of the playback picture is displayed as Mbps (Mega bit per second) and the audio as kbps (kilo bit per second). The higher the bit rate, the larger the amount of data. However, this does not always mean that you can get higher quality pictures or sounds.

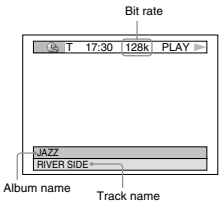
◆LAYER



Indicates the approximate point where the disc is playing.
If it is a dual-layer DVD, the player indicates which layer is being read ("Layer 0" or "Layer 1").
For details on the layers, see page 74 (DVD).

Checking the play information of a DATA CD DATA CD

By pressing TIME/TEXT while playing MP3 audio track on a DATA CD, you can display the audio bit rate (the amount of data per second of the current audio).

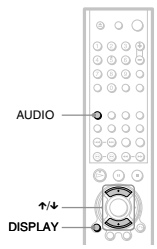


Sound Adjustments

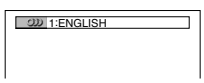
Changing the Sound

DVD VCD CD DATA CD

When playing a DVD recorded in multiple audio formats (PCM, Dolby Digital, MPEG audio, or DTS), you can change the audio format. If the DVD is recorded with multilingual tracks, you can also change the language.
With CDs, DATA CDs, or VIDEO CDs, you can select the sound from the right or left channel and listen to the sound of the selected channel through both the right and left speakers. For example, when playing a disc containing a song with the vocals on the right channel and the instruments on the left channel, you can hear the instruments from both speakers by selecting the left channel.



1 Press AUDIO during playback.
The following display appears.



2 Press AUDIO repeatedly to select the desired audio signal.

◆ When playing a DVD
Depending on the DVD, the choice of language varies.
When 4 digits are displayed, they indicate a language code. Refer to "Language Code List" on page 76 to see which language the code represents.
When the same language is displayed two or more times, the DVD is recorded in multiple audio formats.

◆ When playing a VIDEO CD, CD, or DATA CD (MP3 audio)
The default setting is underlined.
- STEREO: The standard stereo sound
- 1/L: The sound of the left channel (monaural)
- 2/R: The sound of the right channel (monaural)

◆ When playing a Super VCD
The default setting is underlined.
- 1: STEREO: The stereo sound of the audio track 1
- 1: 1/L: The sound of the left channel of the audio track 1 (monaural)
- 1: 2/R: The sound of the right channel of the audio track 1 (monaural)
- 2: STEREO: The stereo sound of the audio track 2
- 2: 1/L: The sound of the left channel of the audio track 2 (monaural)
- 2: 2/R: The sound of the right channel of the audio track 2 (monaural)

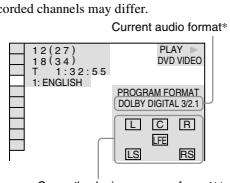
Hint
You can also select "AUDIO" from the Control Menu (page 12).

Note
While playing a Super VCD on which the audio track is not recorded, no sound will come out when you select "2:STEREO," "2:1/L," or "2:2/R."

Displaying the audio information of the disc DVD

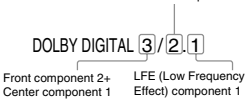
Press DISPLAY during playback to display the Control Menu. Select "AUDIO" using ↑/↓. The channels being played are displayed on the screen.

For example, in Dolby Digital format, multiple signals ranging from monaural to 5.1 channel signals can be recorded on a DVD. Depending on the DVD, the number of the recorded channels may differ.



*"PCM," "MPEG," "DTS," or "DOLBY DIGITAL" is displayed.
In the case of "DOLBY DIGITAL," the channels in the playing track are displayed by numbers as follows:

For Dolby Digital 5.1 ch:



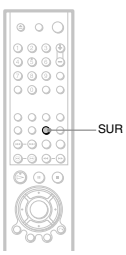
**The letters in the programme format display mean the following sound component:
L: Front (left)
R: Front (right)
C: Centre
LS: Rear (left)
RS: Rear (right)
S: Rear (monaural): The rear component of the Dolby Surround processed signal and the Dolby Digital signal
LFE: Low Frequency Effect signal

Hint
For Dolby Digital 5.1 ch and DTS, "LFE" is always enclosed in a solid line regardless of the LFE signal component being output.

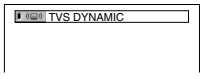
Note
If "DTS" is set to "OFF" in "AUDIO SETUP" (page 70), the DTS track selection option will not appear on the screen even if the disc contains DTS tracks.

TV Virtual Surround Settings (TVS) DVD

When you connect a stereo TV or 2 front speakers, TVS (TV Virtual Surround) lets you enjoy surround sound effects by using sound imaging to create virtual rear speakers from the sound of the front speakers (L: left, R: right) without using actual rear speakers. TVS was developed by Sony to produce surround sound for home use using just a stereo TV.
This function is designed to work with the LINE OUT L/R (AUDIO) 1/2 jacks.
Note that if you select one of the TVS settings, the player does not output the following signals from the DIGITAL OUT (OPTICAL or COAXIAL) jack.
- Dolby Digital signals (when you set "DOLBY DIGITAL" in "AUDIO SETUP" to "D-PCM") (page 70)
- MPEG audio signals



1 Press SUR during playback.
The following display appears.



➡continued

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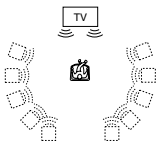
2 Press SUR repeatedly to select one of the TVS sounds.

Refer to the following explanations given for each item.
- TVS DYNAMIC
- TVS WIDE
- TVS NIGHT
- TVS STANDARD

To cancel the setting
Select "OFF" in Step 2.

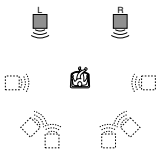
◆TVS DYNAMIC
Creates virtual rear speakers from the sound of the front speakers (L, R) without using actual rear speakers (shown below).
This mode is effective when the distance between the front L and R speakers is short, such as with built-in speakers on a stereo TV.

◆TVS WIDE
Creates virtual rear speakers from the sound of the front speakers (L, R) without using actual rear speakers. The virtual speakers are reproduced as shown in the illustration below.
This mode is effective when the distance between the front L and R speakers is short, such as with built-in speakers on a stereo TV.



◆TVS NIGHT
Large sounds, such as explosions, are suppressed, but the quieter sounds are unaffected. This feature is useful when you want to hear the dialog and enjoy the surround sound effects of "TVS WIDE" at low volume.

◆TVS STANDARD
Creates virtual rear speakers from the sound of the front speakers (L, R) without using actual rear speakers. The virtual speakers are reproduced as shown in the illustration below. Use this setting when you want to use TVS with 2 separate speakers.



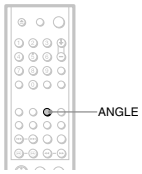
L: Front speaker (left)
R: Front speaker (right)
□: Virtual speaker

Hints
- You can also select "TVS" by pressing SURROUND button on the player.
- You can also select "TVS" from the Control Menu (page 12).

Notes
- When the playing signal does not contain a signal for the rear speakers, the surround effects cannot be heard.
- When you select one of the TVS modes, turn off the surround setting of the connected TV or amplifier (receiver).
- Make sure that your listening position is between and at an equal distance from your speakers, and that the speakers are located in similar surroundings.
- "TVS NIGHT" only works with Dolby Digital discs. However, not all discs will respond to the "TVS NIGHT" function in the same way.
- If you use the DIGITAL OUT (OPTICAL or COAXIAL) jack and set "DOLBY DIGITAL" to "DOLBY DIGITAL" or "DTS" to "ON" in "AUDIO SETUP," sound will come from your speakers but it will not have the TVS effect.

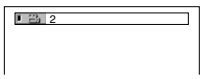
Changing the Angles DVD

If various angles (multi-angles) for a scene are recorded on the DVD, "ANGLE" appears in the front panel display. This means that you can change the viewing angle.



1 Press ANGLE during playback.

The number of the angle appears on the display.



2 Press ANGLE repeatedly to select the angle number.

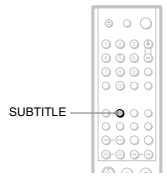
The scene changes to the selected angle.

Hints
- You can display all the angles recorded on the disc on the same screen, and start playback directly from the chosen angle. The angles are displayed on a screen divided into 9 sections (page 41).
- You can also select "ANGLE" from the Control Menu (page 12).

Note
Depending on the DVD, you may not be able to change the angles even if multi-angles are recorded on the DVD.

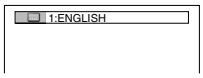
Displaying the Subtitles DVD

If subtitles are recorded on the discs, you can change the subtitles or turn them on and off whenever you want while playing a DVD.



1 Press SUBTITLE during playback.

The following display appears.



2 Press SUBTITLE repeatedly to select the language.

Depending on the DVD, the choice of language varies.
When 4 digits are displayed, they indicate a language code. Refer to "Language Code List" on page 76 to see which language the code represents.

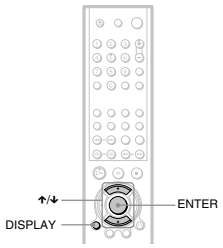
To turn off the subtitles
Select "OFF" in Step 2.

Hint
You can also select "SUBTITLE" from the Control Menu (page 12).

Note
Depending on the DVD, you may not be able to change the subtitles even if multilingual subtitles are recorded on it. You also may not be able to turn them off.

Adjusting the Picture Quality (BNR) DVD VCD

The Block Noise Reduction (BNR) function adjusts the picture quality by reducing the "block noise" or mosaic like patterns that appear on your TV screen.

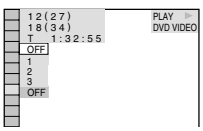


1 Press DISPLAY twice during playback.

The Control Menu appears.

2 Press ↑/↓ to select BNR (BNR), then press ENTER.

The options for "BNR" appear.



3 Press ↑/↓ to select a level.
- 1: reduces the "block noise."
- 2: reduces the "block noise" more than 1.
- 3: reduces the "block noise" more than 2.

4 Press ENTER.

The disc plays with the setting you selected.

To cancel the "BNR" setting
Select "OFF" in Step 3.

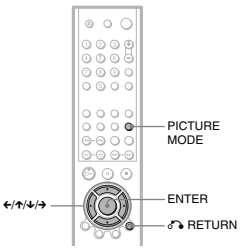
To turn off the Control Menu
Press DISPLAY repeatedly until the Control Menu is turned off.

Notes
- If the outlines of the images on your screen should become blurred, set "BNR" to "OFF."
- Depending on the disc or the scene being played, the "BNR" effect may be hard to discern.

Adjusting the Playback Picture (CUSTOM PICTURE MODE)

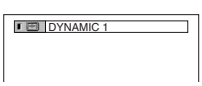
DVD VCD

You can adjust the video signal of the DVD or VIDEO CD from the player to obtain the picture quality you want. Choose the setting that best suits the programme you are watching.
When you select "MEMORY," you can make further adjustments to each element of the picture (colour, brightness, etc.).



1 Press PICTURE MODE during playback.

The following display appears.



2 Press PICTURE MODE repeatedly to select the setting you want.

The default setting is underlined.
- STANDARD: displays a standard picture.
- DYNAMIC 1: produces a bold dynamic picture by increasing the picture contrast and the colour intensity.
- DYNAMIC 2: produces a more dynamic picture than DYNAMIC 1 by further increasing the picture contrast and the colour intensity.
- CINEMA 1: enhances details in dark areas by increasing the black level.
- CINEMA 2: White colours become brighter and black colours become richer, and the colour contrast is increased.
- MEMORY: adjusts the picture in greater detail.

Hints
- When you watch a movie, "CINEMA 1" or "CINEMA 2" is recommended.
- The picture can be adjusted by pressing PICTURE MODE button on the player as well.
- You can also select "CUSTOM PICTURE MODE" from the Control Menu (page 12).

Adjusting the picture items in "MEMORY"

You can adjust each element of the picture individually.
- PICTURE: changes the contrast
- BRIGHTNESS: changes the overall brightness
- COLOR: makes the colours deeper or lighter
- HUE: changes the colour balance

1 Press PICTURE MODE repeatedly to select "MEMORY" and press ENTER.

The "PICTURE" adjustment bar appears.

2 Press ←/→ to adjust the picture contrast, then press ENTER.

The adjustment is saved, and "BRIGHTNESS" adjustment bar appears.

3 Repeat Step 2 to adjust "BRIGHTNESS," "COLOR," and "HUE."

→continued

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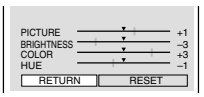
The Custom Picture Mode display appears. You can check each adjustment.



To turn off the display

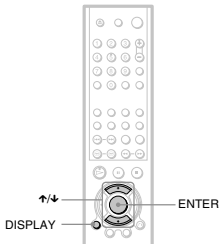
Press ↶ RETURN , or select "RETURN" in Step 3 and press ENTER.

Hints

- To reset the picture items to the default values, press → after Step 3 to select "RESET" and press ENTER.
- When "PLAYBACK MEMORY" in "CUSTOM SETUP" is set to "ON," the player will save a single setting for up to 40 individual discs.
- If you do not want to save the adjustment in Step 2, you can go to the next picture item by pressing ↑/↓ without saving.

Enhancing the Playback Picture (DIGITAL VIDEO ENHANCER) DVD VCD

The Digital Video Enhancer (DVE) function makes the picture appear clear and crisp by enhancing the outlines of images on your TV screen. Also, this function can soften the images on the screen.

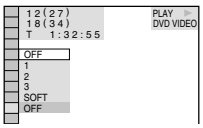


1 Press DISPLAY twice during playback.

The Control Menu appears.

2 Press ↑/↓ to select (DIGITAL VIDEO ENHANCER), then press ENTER.

The options for "DIGITAL VIDEO ENHANCER" appear.



3 Press ↑/↓ to select a level.

- 1: enhances the outline.
- 2: enhances the outline more than 1.
- 3: enhances the outline more than 2.
- SOFT: softens the image (DVD only).

4 Press ENTER.

The disc plays with the setting you selected.

To cancel the "DIGITAL VIDEO ENHANCER" setting

Select "OFF" in Step 3.

To turn off the Control Menu

Press DISPLAY repeatedly until the Control Menu is turned off.

Note

Depending on the disc or the scene being played, noise found in the disc may become more apparent. If this happens, it is recommended that you use the BNR function (page 54) with the DVE function. If the condition still does not improve, reduce the Digital Video Enhancer level, or select "SOFT" (DVD only) in Step 3 above.

Locking Discs (CUSTOM PARENTAL CONTROL, PARENTAL CONTROL)

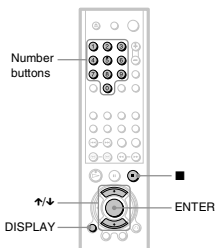
You can set two kinds of playback restrictions for the desired disc.

- Custom Parental Control
  You can set playback restrictions so that the player will not play inappropriate discs.
- Parental Control
  Playback of some DVDs can be limited according to a predetermined level such as the age of the users. Scenes may be blocked or replaced with different scenes.

The same password is used for both Parental Control and Custom Parental Control.

Custom Parental Control DVD VCD CD

You can set the same Custom Parental Control password for up to 40 discs. When you set the 41st-disc, the first disc is cancelled.



1 Insert the disc you want to lock.

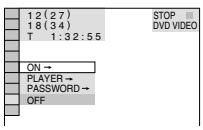
If the disc is playing, press ■ to stop playback.

2 Press DISPLAY while the player is in stop mode.

The Control Menu appears.

3 Press ↑/↓ to select (PARENTAL CONTROL), then press ENTER.

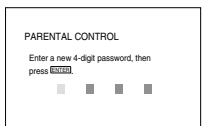
The options for "PARENTAL CONTROL" appear.



4 Press ↑/↓ to select "ON →," then press ENTER.

◆ If you have not entered a password

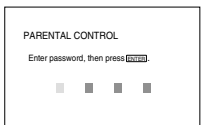
The display for registering a new password appears.



Enter a 4-digit password using the number buttons, then press ENTER. The display for confirming the password appears.

◆ When you have already registered a password

The display for entering the password appears.



5 Enter or re-enter your 4-digit password using the number buttons, then press ENTER.

"Custom parental control is set." appears and then the screen returns to the Control Menu.

To turn off the Custom Parental Control function

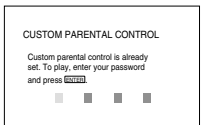
1 Follow Steps 1 through 3 of "Custom Parental Control."

2 Press ↑/↓ to select "OFF →," then press ENTER.

3 Enter your 4-digit password using the number buttons, then press ENTER.

To play a disc for which Custom Parental Control is set

1 Insert the disc for which Custom Parental Control is set.
The "CUSTOM PARENTAL CONTROL" display appears.



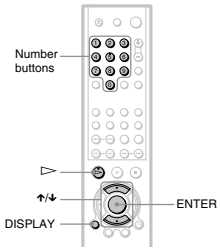
2 Enter your 4-digit password using the number buttons, then press ENTER.
The player is ready for playback.

Hint

If you forget your password, enter the 6-digit number "199703" using the number buttons when the "CUSTOM PARENTAL CONTROL" display asks you for your password, then press ENTER. The display will ask you to enter a new 4-digit password.

Parental Control (limited playback) DVD

Playback of some DVDs can be limited according to a predetermined level such as the age of the users. The "PARENTAL CONTROL" function allows you to set a playback limitation level.

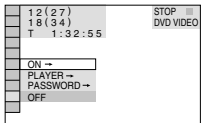


1 Press DISPLAY while the player is in stop mode.

The Control Menu appears.

2 Press ↑/↓ to select (PARENTAL CONTROL), then press ENTER.

The options for "PARENTAL CONTROL" appear.



3 Press ↑/↓ to select "PLAYER →," then press ENTER.

◆ If you have not entered a password

The display for registering a new password appears.

Enter a 4-digit password using the number buttons, then press ENTER. The display for confirming the password appears.

➡continued

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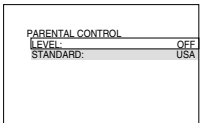
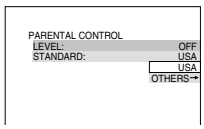
◆ When you have already registered a password
The display for entering the password appears.

4 Enter or re-enter your 4-digit password using the number buttons, then press ENTER.
The display for setting the playback limitation level appears.

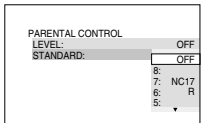


5 Press ↑/↓ to select "STANDARD," then press ENTER.
The selection items for "STANDARD" are displayed.

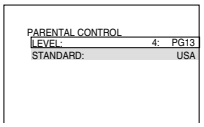


6 Press ↑/↓ to select a geographic area as the playback limitation level, then press ENTER.
The area is selected.
When you select "OTHERS →," select and enter a standard code in the table on page 61 using the number buttons.

7 Press ↑/↓ to select "LEVEL," then press ENTER.
The selection items for "LEVEL" are displayed.



8 Select the level you want using ↑/↓, then press ENTER.
Parental Control setting is complete.



The lower the value, the stricter the limitation.

To turn off the Parental Control function
Set "LEVEL" to "OFF" in Step 8.

To play a disc for which Parental Control is set

1 Insert the disc and press ▷.
The display for entering your password appears.

2 Enter your 4-digit password using the number buttons, then press ENTER.
The player starts playback.

Hint
If you forget your password, remove the disc and repeat Steps 1 to 3 of "Parental Control (limited playback)." When you are asked to enter your password, enter "199703" using the number buttons, then press ENTER. The display will ask you to enter a new 4-digit password. After you enter a new 4-digit password, replace the disc in the player and press ▷. When the display for entering your password appears, enter your new password.

Notes
- When you play discs which do not have the Parental Control function, playback cannot be limited on this player.
- Depending on the disc, you may be asked to change the parental control level while playing the disc. In this case, enter your password, then change the level. If the Resume Play mode is cancelled, the level returns to the previous level.

Area Code

Standard	Code number	Standard	Code number
Argentina	2044	Korea	2304
Australia	2047	Malaysia	2363
Austria	2046	Mexico	2362
Belgium	2057	Netherlands	2376
Brazil	2070	New Zealand	2390
Canada	2079	Norway	2379
Chile	2090	Pakistan	2427
China	2092	Philippines	2424
Denmark	2115	Portugal	2436
Finland	2165	Russia	2489
France	2174	Singapore	2501
Germany	2109	Spain	2149
India	2248	Sweden	2499
Indonesia	2238	Switzerland	2086
Italy	2254	Thailand	2528
Japan	2276	United Kingdom	2184

Changing the password

1 Press DISPLAY while the player is in stop mode.
The Control Menu appears.

2 Press ↑/↓ to select (PARENTAL CONTROL), then press ENTER.
The options for "PARENTAL CONTROL" appear.

3 Press ↑/↓ to select "PASSWORD →," then press ENTER.
The display for entering the password appears.

4 Enter your 4-digit password using the number buttons, then press ENTER.

5 Enter a new 4-digit password using the number buttons, then press ENTER.

6 To confirm your password, re-enter it using the number buttons, then press ENTER.

If you make a mistake entering your password
Press ← before you press ENTER and input the correct number.

If you make a mistake
Press ↶ RETURN.

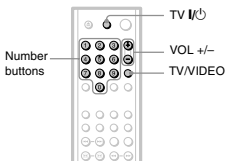
To turn off the display
Press DISPLAY repeatedly until the display is turned off.

Controlling Your TV or AV Amplifier (Receiver) with the Supplied Remote

By adjusting the remote signal, you can control your TV with the supplied remote. If you connect the player with an AV amplifier (receiver), you can control the volume with the supplied remote.

Notes
- Depending on the unit being connected, you may not be able to control your TV or AV amplifier (receiver) using some of the buttons below.
- If you enter a new code number, the code number previously entered will be erased.
- When you replace the batteries of the remote, the code number you have set may be reset to the default setting. Set the appropriate code number again.

Controlling TVs with the remote



1 Hold down TV I/⏻, and enter your TV's manufacturer's code (see "Code numbers of controllable TVs" below) using the number buttons.

2 Release TV I/⏻.
The remote is set to perform the followings:

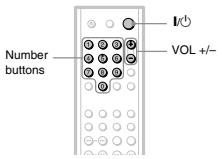
TV I/⏻	Turns the TV on or off
VOL +/–*	Adjusts the volume of the TV
TV/VIDEO	Switches the TV's input source between the TV and other input sources

* Once you set a code number for your AV amplifier (receiver), the VOL +/– buttons on the remote control the AV amplifier's volume only. If you would rather control the TV's volume, set the code number to "90" (default) to control the TV's volume again.

Code numbers of controllable TVs
If more than one code number is listed, try entering them one at a time until you find the one that works with your TV.

Manufacturer	Code number
Sony	01(default), 03, 04
Aiwa	32
Akai	68
Blaupunkt	10, 21
Grundig	10, 11
Hitachi	24
JVC	33
LG	06
Loewe	45
Mitsubishi	27, 28, 50
Mivar	09
NEC	66
Nokia	15, 16, 69
Orion	47, 48
Panasonic	17, 49
Philips	06, 07, 08
Pioneer	26
Saba	12, 13
Samsung	22, 23
Sanyo	25
Sharp	29
Siemens	39
TEAC	67
Telefunken	36
Thomson	43
Toshiba	38

Controlling the volume of your AV amplifier (receiver) with the remote



1 Hold down I/⏻, and enter your AV amplifier (receiver)'s manufacturer's code (see the table below) using the number buttons.

2 Release I/⏻.
You can control the volume of the AV amplifier (receiver) using VOL +/–.

Code numbers of controllable AV amplifiers (receivers)
If more than one code number is listed, try entering them one at a time until you find the one that works with your AV amplifier (receiver).

Manufacturer	Code number
Sony	80, 88, 89, 91
Denon	84, 85, 86
Kenwood	92, 93
Onkyo	81, 82, 83
Pioneer	99
Sansui	87
Technics	97, 98
Yamaha	94, 95, 96

If you would rather control the volume of your TV
Repeat Steps 1 and 2 above and enter the code number 90 (default).

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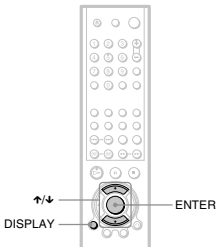
Using the Setup Display

By using the Setup Display, you can make various adjustments to items such as picture and sound. You can also set a language for the subtitles and the Setup Display, among other things. For details on each Setup Display item, see pages from 65 to 70.

Note

Playback settings stored in the disc take priority over the Setup Display settings and not all the functions described may work.

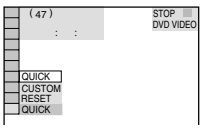


1 Press DISPLAY when the player is in stop mode.

The Control Menu appears.

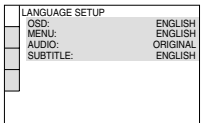
2 Press ↑/↓ to select (SETUP), then press ENTER.

The options for "SETUP" appear.



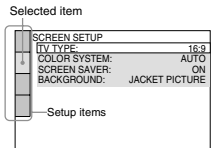
3 Press ↑/↓ to select "CUSTOM," then press ENTER.

The Setup Display appears.



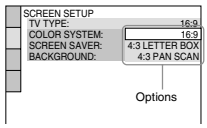
4 Press ↑/↓ to select the setup item from the displayed list: "LANGUAGE SETUP," "SCREEN SETUP," "CUSTOM SETUP," or "AUDIO SETUP." Then press ENTER.

The Setup item is selected.
Example: "SCREEN SETUP"



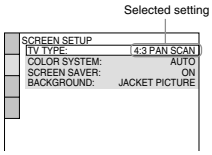
5 Select an item using ↑/↓, then press ENTER.

The options for the selected item appear.
Example: "TV TYPE"



6 Select a setting using ↑/↓, then press ENTER.

The setting is selected and setup is complete.
Example: "4:3 PAN SCAN"



To turn off the display

Press DISPLAY repeatedly until the display is turned off.

To enter the Quick Setup mode

Select "QUICK" in Step 3. Follow from Step 5 of the Quick Setup explanation to make basic adjustments (page 25).

To reset all of the "SETUP" settings

1 Select "RESET" in Step 3 and press ENTER.

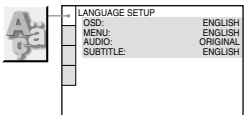
2 Select "YES" using ↑/↓.
You can also quit the process and return to the Control Menu by selecting "NO" here.

3 Press ENTER.
All the settings explained on pages 65 to 70 return to the default settings. Do not press I/⏻ while resetting the player as it takes a few seconds to complete.

Setting the Display or Sound Track Language (LANGUAGE SETUP)

"LANGUAGE SETUP" allows you to set various languages for the on-screen display or sound track.

Select "LANGUAGE SETUP" in the Setup Display. To use the display, see "Using the Setup Display" (page 64).



◆ OSD (On-Screen Display)
Switches the display language on the screen.

◆ MENU (DVD only)
You can select the desired language for the disc's menu.

◆ AUDIO (DVD only)
Switches the language of the sound track. When you select "ORIGINAL," the language given priority in the disc is selected.

◆ SUBTITLE (DVD only)
Switches the language of the subtitle recorded on the DVD.
When you select "AUDIO FOLLOW," the language for the subtitles changes according to the language you selected for the sound track.

Hint

If you select "OTHERS →" in "MENU," "SUBTITLE," and "AUDIO," select and enter a language code from "Language Code List" on page 76 using the number buttons.

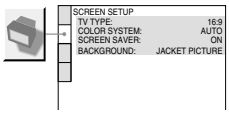
Note

When you select a language in "MENU," "SUBTITLE," or "AUDIO" that is not recorded on the DVD, one of the recorded languages will be automatically selected.

Settings for the Display (SCREEN SETUP)

Choose settings according to the TV to be connected.

Select "SCREEN SETUP" in the Setup Display. To use the display, see "Using the Setup Display" (page 64).
The default settings are underlined.



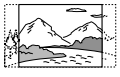
◆ TV TYPE
Selects the aspect ratio of the connected TV (4:3 standard or wide).

16:9	Select this when you connect a wide-screen TV or a TV with a wide mode function.
4:3 LETTER BOX	Select this when you connect a 4:3 screen TV. Displays a wide picture with bands on the upper and lower portions of the screen.
4:3 PAN SCAN	Select this when you connect a 4:3 screen TV. Automatically displays the wide picture on the entire screen and cuts off the portions that do not fit.

16:9

4:3 LETTER BOX

4:3 PAN SCAN



Note

Depending on the DVD, "4:3 LETTER BOX" may be selected automatically instead of "4:3 PAN SCAN" or vice versa.

◆ COLOR SYSTEM (VIDEO CD only)
Select the colour system when you play a VIDEO CD.

AUTO	Outputs the video signal in the system of the VIDEO CD, either PAL or NTSC. If your TV is the DUAL system, select AUTO.
PAL	Changes the video signal of an NTSC VIDEO CD and outputs it in the PAL system.
NTSC	Changes the video signal of a PAL VIDEO CD and outputs it in the NTSC system.

Notes

- You cannot change the colour system for DVDs.
- You can change the colour system of this player according to the connected TV. See page 16.

◆ SCREEN SAVER
The screen saver image appears when you leave the player in pause or stop mode for 15 minutes, or when you play back a CD or DATA CD (MP3 audio) for more than 15 minutes. The screen saver will help prevent your display device from becoming damaged (ghosting). Press ▷ to turn off the screen saver.

ON	Turns on the screen saver.
OFF	Turns off the screen saver.

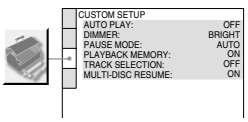
◆ BACKGROUND
Selects the background colour or picture on the TV screen in stop mode or while playing a CD or DATA CD (MP3 audio).

JACKET PICTURE	The jacket picture (still picture) appears, but only when the jacket picture is already recorded on the disc (CD-EXTRA, etc.). If the disc does not contain a jacket picture, the "GRAPHICS" picture appears.
GRAPHICS	A preset picture stored in the player appears.
BLUE	The background colour is blue.
BLACK	The background colour is black.

Custom Settings (CUSTOM SETUP)

Use this to set up playback related and other settings.

Select "CUSTOM SETUP" in the Setup Display. To use the display, see "Using the Setup Display" (page 64).
The default settings are underlined.



◆ AUTO PLAY
Switches the Auto Play setting on or off. This function is useful when the player is connected to a timer (not supplied).

OFF	Switches this function off.
ON	Automatically starts playback when the player is turned on.

◆ DIMMER
Adjusts the lighting of the front panel display.

BRIGHT	Makes the lighting bright.
DARK	Makes the lighting dark.
OFF	Turns off the lighting.

◆ PAUSE MODE (DVD only)
Selects the picture in pause mode.

AUTO	The picture, including subjects that move dynamically, is output with no jitter. Normally select this position.
FRAME	The picture, including subjects that do not move dynamically, is output in high resolution.

➡continued

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◆ PLAYBACK MEMORY (DVD/VIDEO CD only)

The player can store the "SUBTITLE" and other settings of each disc for up to 40 discs (Playback Memory).
Set this function "ON" or "OFF."

ON	Stores the settings in memory when you eject the disc.
OFF	Does not store the settings in memory.

The following settings are stored in memory.
– ANGLE (page 53)*
– AUDIO (page 50)*
– BNR (page 54)
– DIGITAL VIDEO ENHANCER (page 56)
– SUBTITLE (page 53)*
– CUSTOM PICTURE MODE (page 55)
* DVD only

Note

The player can store the settings of up to 40 discs. When you store the setting of disc number 41, the first disc setting is cancelled.

◆ TRACK SELECTION (DVD only)

Gives the sound track which contains the highest number of channels priority when you play a DVD on which multiple audio formats (PCM, MPEG audio, DTS, or Dolby Digital format) are recorded.

OFF	No priority given.
AUTO	Priority given.

Notes

- When you set the item to "AUTO," the language may change. The "TRACK SELECTION" setting has higher priority than the "AUDIO" settings in "LANGUAGE SETUP" (page 65).
- If you set "DTS" to "OFF" (page 70), the DTS sound track is not played even if you set "TRACK SELECTION" to "AUTO."
- If PCM, DTS, MPEG audio, and Dolby Digital sound tracks have the same number of channels, the player selects PCM, DTS, Dolby Digital, and MPEG audio sound tracks in this order.

◆ MULTI-DISC RESUME (DVD/VIDEO CD only)

Switches the Multi-disc Resume setting on or off. Resume playback point can be stored in memory for up to 40 different DVD/VIDEO CD discs (page 31).

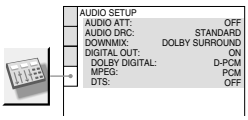
ON	Stores the resume settings in memory for up to 40 discs (The settings remain in memory even if you select OFF.)
OFF	Does not store the resume settings in memory. Playback restarts at the resume point only for the current disc in the player.

Settings for the Sound

(AUDIO SETUP)

"AUDIO SETUP" allows you to set the sound according to the playback and connection conditions.

Select "AUDIO SETUP" in the Setup Display. To use the display, see "Using the Setup Display" (page 64).
The default settings are underlined.



◆ AUDIO ATT (attenuation)

If the playback sound is distorted, set this item to "ON." The player reduces the audio output level.
This function affects the output of the LINE OUT L/R (AUDIO) 1/2 jacks.

OFF	Normally, select this position.
ON	Select this when the playback sound from the speakers is distorted.

◆ AUDIO DRC (Dynamic Range Control) (DVD only)

Makes the sound clear when the volume is turned down when playing a DVD that conforms to "AUDIO DRC." This affects the output from the following jacks:
– LINE OUT L/R (AUDIO) 1/2 jacks
– DIGITAL OUT (OPTICAL or COAXIAL) jack only when "DOLBY DIGITAL" is set to "D-PCM" (page 70).

STANDARD	Normally select this position.
TV MODE	Makes the low sounds clear even if you turn the volume down.
WIDE RANGE	Gives you the feeling of being at a live performance.

◆ DOWNMIX (DVD only)

Switches the method for mixing down to 2 channels when you play a DVD which has rear sound elements (channels) or is recorded in Dolby Digital format. For details on the rear signal components, see "Displaying the audio information of the disc" (page 50). This function affects the output of the following jacks:
– LINE OUT L/R (AUDIO) 1/2 jacks
– DIGITAL OUT (OPTICAL or COAXIAL) jack when "DOLBY DIGITAL" is set to "D-PCM" (page 70).

DOLBY SURROUND	Select this when the player is connected to an audio component that conforms to Dolby Surround (Pro Logic).
NORMAL	Select this when the player is connected to an audio component that does not conform to Dolby Surround (Pro Logic).

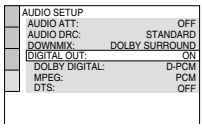
◆ DIGITAL OUT

Selects if audio signals are output via the DIGITAL OUT (OPTICAL or COAXIAL) jack.

ON	Normally select this position. When you select "ON," see "Setting the digital output signal" for further settings.
OFF	The influence of the digital circuit upon the analog circuit is minimal.

Setting the digital output signal

Switches the method of outputting audio signals when you connect a component such as an amplifier (receiver) or MD deck with a digital input jack.
For connection details, see page 20.
Select "DOLBY DIGITAL," "MPEG," and "DTS" after setting "DIGITAL OUT" to "ON."



➞continued

If you connect a component that does not conform to the selected audio signal, a loud noise (or no sound) will come out from the speakers, affecting your ears or causing the speakers to be damaged.

◆ DOLBY DIGITAL (DVD only)

Selects the type of Dolby Digital signal.

D-PCM	Select this when the player is connected to an audio component lacking a built-in Dolby Digital decoder. You can select whether the signals conform to Dolby Surround (Pro Logic) or not by making adjustments to the "DOWNMIX" item in "AUDIO SETUP" (page 69).
DOLBY DIGITAL	Select this when the player is connected to an audio component with a built-in Dolby Digital decoder.

◆ MPEG (DVD only)

Selects the type of MPEG audio signal.

PCM	Select this when the player is connected to an audio component lacking a built-in MPEG decoder. If you play MPEG audio sound tracks, the player outputs stereo signals via the DIGITAL OUT (OPTICAL or COAXIAL) jack.
MPEG	Select this when the player is connected to an audio component with a built-in MPEG decoder.

◆ DTS (DVD only)

Selects whether or not to output DTS signals.

OFF	Select this when the player is connected to an audio component lacking a built-in DTS decoder.
ON	Select this when the player is connected to an audio component with a built-in DTS decoder.

Note

If you select one of the TVS settings while playing a DVD, the player does not output the following signals from the DIGITAL OUT (OPTICAL or COAXIAL) jack.
– Dolby Digital signals (when you set "DOLBY DIGITAL" in "AUDIO SETUP" to "D-PCM") (page 70).
– MPEG audio signals.

Additional Information

Troubleshooting

If you experience any of the following difficulties while using the player, use this troubleshooting guide to help remedy the problem before requesting repairs. Should any problem persist, consult your nearest Sony dealer.

Power

The power is not turned on.

➞ Check that the power cord (mains lead) is connected securely.

Picture

There is no picture/picture noise appears.

➞ Re-connect the connecting cord securely.
➞ The connecting cords are damaged.
➞ Check the connection to your TV (page 18) and switch the input selector on your TV so that the signal from the player appears on the TV screen.
➞ The disc is dirty or flawed.
➞ If the picture output from your player goes through your VCR to get to your TV or if you are connected to a combination TV/VIDEO player, the copy-protection signal applied to some DVD programmes could affect picture quality. If you still experience problems even when you connect your player directly to your TV, please try connecting your player to your TV's S VIDEO input (page 18).
➞ If the colour system of your player does not match with that of your TV, change the colour system of the player. For details, see page 16. (You cannot change the colour system of the DVD disc itself.)

Even though you set the aspect ratio in "TV TYPE" of "SCREEN SETUP," the picture does not fill the screen.

➞ The aspect ratio of the disc is fixed on your DVD.

Sound

There is no sound.

➞ Re-connect the connecting cord securely.
➞ The connecting cord is damaged.
➞ The player is connected to the wrong input jack on the amplifier (receiver) (page 22, 23, 24).
➞ The amplifier (receiver) input is not correctly set.
➞ The player is in pause mode or in Slow-motion Play mode.
➞ The player is in fast forward or fast reverse mode.
➞ If the audio signal does not come through the DIGITAL OUT (OPTICAL or COAXIAL) jack, check the audio settings (page 69).
➞ While playing a Super VCD on which the audio track 2 is not recorded, no sound will come out when you select "2:STEREO," "2:1/L," or "2:2/R."

Sound is noisy.

➞ When playing a CD with DTS sound tracks, noise will come from the LINE OUT L/R (AUDIO) 1/2 jacks or DIGITAL OUT (OPTICAL or COAXIAL) jack (page 28).

Sound distortion occurs.

➞ Set "AUDIO ATT" in "AUDIO SETUP" to "ON" (page 69).

The sound volume is low.

➞ The sound volume is low on some DVDs. The sound volume may improve if you set "AUDIO DRC" to "TV MODE" (page 69).
➞ Set "AUDIO ATT" in "AUDIO SETUP" to "OFF" (page 69).

➞continued

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Operation

The remote does not function.
- ➡ There are obstacles between the remote and the player.
- ➡ The distance between the remote and the player is too far.
- ➡ The remote is not pointed at the remote sensor on the player.
- ➡ The batteries in the remote are weak.

The disc does not play.
- ➡ The disc is turned over. Insert the disc with the playback side facing down on the disc tray.
- ➡ The disc is skewed.
- ➡ The player cannot play certain discs (page 6).
- ➡ The region code on the DVD does not match the player.
- ➡ Moisture has condensed inside the player (page 3).
- ➡ The player cannot play CD-Rs, CD-RWs, DVD-Rs, or DVD-RWs (video mode) that are not finalized (page 6).

The MP3 audio track cannot be played (page 34).
- ➡ The DATA CD is not recorded in the MP3 format that conforms to ISO9660 Level 1/ Level 2 or Joliet.
- ➡ The MP3 audio track does not have the extension ".MP3."
- ➡ The data is not formatted in MP3 even though it has the extension ".MP3."
- ➡ The data is not MPEG1 Audio Layer 3 data.
- ➡ The player cannot play audio tracks in MP3PRO format.

The title of the MP3 audio album or track is not correctly displayed.
- ➡ The player can only display numbers and alphabet. Other characters are displayed as "*."

The disc does not start playing from the beginning.
- ➡ Programme Play, Shuffle Play, Repeat Play, or A-B Repeat Play has been selected (page 35).
- ➡ Resume play has taken effect (page 31).

The player starts playing the disc automatically.
- ➡ The disc features an auto playback function.
- ➡ "AUTO PLAY" in "CUSTOM SETUP" is set to "ON" (page 67).

Playback stops automatically.
- ➡ While playing discs with an auto pause signal, the player stops playback at the auto pause signal.

You cannot perform some functions such as Stop, Search, Slow-motion Play, Repeat Play, Shuffle Play, or Programme Play.
- ➡ Depending on the disc, you may not be able to do some of the operations above. See the operating manual that comes with the disc.

The language for the sound track cannot be changed.
- ➡ Try using the DVD's menu instead of the direct selection button on the remote (page 32).
- ➡ Multilingual tracks are not recorded on the DVD being played.
- ➡ The DVD prohibits the changing of the language for the sound track.

The subtitle language cannot be changed or turned off.
- ➡ Try using the DVD's menu instead of the direct selection button on the remote (page 32).
- ➡ Multilingual subtitles are not recorded on the DVD being played.
- ➡ The DVD prohibits the changing of the subtitles.

The angles cannot be changed.
- ➡ Try using the DVD's menu instead of the direct selection button on the remote (page 32).
- ➡ Multi-angles are not recorded on the DVD being played.
- ➡ The angle can only be changed when the "ANGLE" indicator lights up on the front panel display (page 9).
- ➡ The DVD prohibits changing of the angles.

The player does not operate properly.
- ➡ When static electricity, etc., causes the player to operate abnormally, unplug the player.

Nothing is displayed on the front panel display.
- ➡ "DIMMER" in "CUSTOM SETUP" is set to "OFF." Set "DIMMER" to "BRIGHT" or "DARK" (page 67).

5 numbers or letters are displayed on the screen and on the front panel display.
- ➡ The self-diagnosis function was activated. (See the table on page 73.)

The disc tray does not open and "LOCKED" appears on the front panel display.
- ➡ Child Lock is set (page 29).

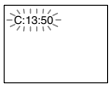
The disc tray does not open and "TRAY LOCKED" appears on the front panel display.
- ➡ Contact your Sony dealer or local authorized Sony service facility.

"Data error" appears on the TV screen when playing a DATA CD.
- ➡ The MP3 audio track you want to play is broken.
- ➡ The data is not MPEG 1 Audio Layer 3 data.

Self-diagnosis Function

(When letters/numbers appear in the display)

When the self-diagnosis function is activated to prevent the player from malfunctioning, a five-character service number (e.g., C 13 50) with a combination of a letter and four digits appears on the screen and the front panel display. In this case, check the following table.



First three characters of the service number	Cause and/or corrective action
C 13	The disc is dirty. ➡Clean the disc with a soft cloth (page 7).
C 31	The disc is not inserted correctly. ➡Re-insert the disc correctly.
E XX (xx is a number)	To prevent a malfunction, the player has performed the self-diagnosis function. ➡Contact your nearest Sony dealer or local authorized Sony service facility and give the 5-character service number. Example: E 61 10

Glossary

Chapter (page 9)
Sections of a picture or a music feature that are smaller than titles. A title is composed of several chapters. Depending on the disc, no chapters may be recorded.

Dolby Digital (page 24, 70)
Digital audio compression technology developed by Dolby Laboratories. This technology conforms to 5.1-channel surround sound. The rear channel is stereo and there is a discrete subwoofer channel in this format. Dolby Digital provides the same 5.1 discrete channels of high quality digital audio found in Dolby Digital cinema audio systems. Good channel separation is realized because all of the channel data are recorded discretely and little deterioration is realized because all channel data processing is digital.

Dolby Surround (Pro Logic) (page 23)
Audio signal processing technology that Dolby Laboratories developed for surround sound. When the input signal contains a surround component, the Pro Logic process outputs the front, centre and rear signals. The rear channel is monaural.

DTS (page 24, 70)
Digital audio compression technology that Digital Theater Systems, Inc. developed. This technology conforms to 5.1-channel surround sound. The rear channel is stereo and there is a discrete subwoofer channel in this format. DTS provides the same 5.1 discrete channels of high quality digital audio.
Good channel separation is realized because all of the channel data is recorded discretely and little deterioration is realized because all channel data processing is digital.

DVD (page 6)
A disc that contains up to 8 hours of moving pictures even though its diameter is the same as a CD.
The data capacity of a single-layer and single-sided DVD is 4.7 GB (Giga Byte), which is 7 times that of a CD. The data capacity of a double-layer and single-sided DVD is 8.5 GB, a single-layer and double-sided DVD is 9.4 GB, and double-layer and double-sided DVD is 17GB.
The picture data uses the MPEG 2 format, one of the worldwide standards of digital compression technology. The picture data is compressed to about 1/40 (average) of its original size. The DVD also uses a variable rate coding technology that changes the data to be allocated according to the status of the picture. Audio information is recorded in a multi-channel format, such as Dolby Digital, allowing you to enjoy a more real audio presence.
Furthermore, various advanced functions such as the multi-angle, multilingual, and Parental Control functions are provided with the DVD.

Index (CD)/Video Index (VIDEO CD) (page 9)
A number that divides a track into sections to easily locate the point you want on a CD or VIDEO CD. Depending on the disc, no index may be recorded.

MPEG audio (page 24, 70)
International standard coding system used to compress audio digital signals authorized by ISO/IEC. MPEG 1 conforms to up to 2-channel stereo. MPEG 2, used on DVDs, conforms to up to 7.1-channel surround.

Scene (page 9)
On a VIDEO CD with PBC (playback control) functions, the menu screens, moving pictures and still pictures are divided into sections called "scenes."

Title (page 9)
The longest section of a picture or music feature on a DVD, movie, etc., in video software, or the entire album in audio software.

Track (page 9)
Sections of a picture or a music feature on a CD or VIDEO CD (the length of a song).

Language Code List

For details, see pages 50, 53, 65.
The language spellings conform to the ISO 639: 1988 (E/F) standard.

Code	Language	Code	Language	Code	Language	Code	Language
1027	Afar	1183	Irish	1347	Maori	1507	Samoan
1028	Abkhazian	1186	Scots Gaelic	1349	Macedonian	1508	Shona
1032	Afrikaans	1194	Galician	1350	Malayalam	1509	Somali
1039	Amharic	1196	Guarani	1352	Mongolian	1511	Albanian
1044	Arabic	1203	Gujarati	1353	Moldavian	1512	Serbian
1045	Assamese	1209	Hausa	1356	Marathi	1513	Siswati
1051	Aymara	1217	Hindi	1357	Malay	1514	Sesotho
1052	Azerbaijani	1226	Croatian	1358	Maltese	1515	Sundanese
1053	Bashkir	1229	Hungarian	1363	Burmese	1516	Swedish
1057	Byelorussian	1233	Armenian	1365	Nauru	1517	Swahili
1059	Bulgarian	1235	Interlingua	1369	Nepali	1521	Tamil
1060	Bihari	1239	Interlingue	1376	Dutch	1525	Telugu
1061	Bislama	1245	Inupiak	1379	Norwegian	1527	Tajik
1066	Bengali; Bangla	1248	Indonesian	1393	Occitan	1528	Thai
		1253	Icelandic	1403	(Afan)Oromo	1529	Tigrinya
1067	Tibetan	1254	Italian	1408	Oriya	1531	Turkmen
1070	Breton	1257	Hebrew	1417	Punjabi	1532	Tagalog
1079	Catalan	1261	Japanese	1428	Polish	1534	Setswana
1093	Corsican	1269	Yiddish	1435	Pashto; Pushto	1535	Tonga
1097	Czech	1283	Javanese			1538	Turkish
1103	Welsh	1287	Georgian	1436	Portuguese	1539	Tsonga
1105	Danish	1297	Kazakh	1463	Quechua	1540	Tatar
1109	German	1298	Greenlandic	1481	Rhaeto-Romance	1543	Twi
1130	Bhutani	1299	Cambodian			1557	Ukrainian
1142	Greek	1300	Kannada	1482	Kirundi	1564	Urdu
1144	English	1301	Korean	1483	Romanian	1572	Uzbek
1145	Esperanto	1305	Kashmiri	1489	Russian	1581	Vietnamese
1149	Spanish	1307	Kurdish	1491	Kinyarwanda	1587	Volapük
1150	Estonian	1311	Kirghiz	1495	Sanskrit	1613	Wolof
1151	Basque	1313	Latin	1498	Sindhi	1632	Xhosa
1157	Persian	1326	Lingala	1501	Sangho	1665	Yoruba
1165	Finnish	1327	Laothian	1502	Serbo-Croatian	1684	Chinese
1166	Fiji	1332	Lithuanian			1697	Zulu
1171	Faroese	1334	Latvian; Lettish	1503	Singhalese		
1174	French			1505	Slovak		
1181	Frisian	1345	Malagasy	1506	Slovenian	1703	Not specified

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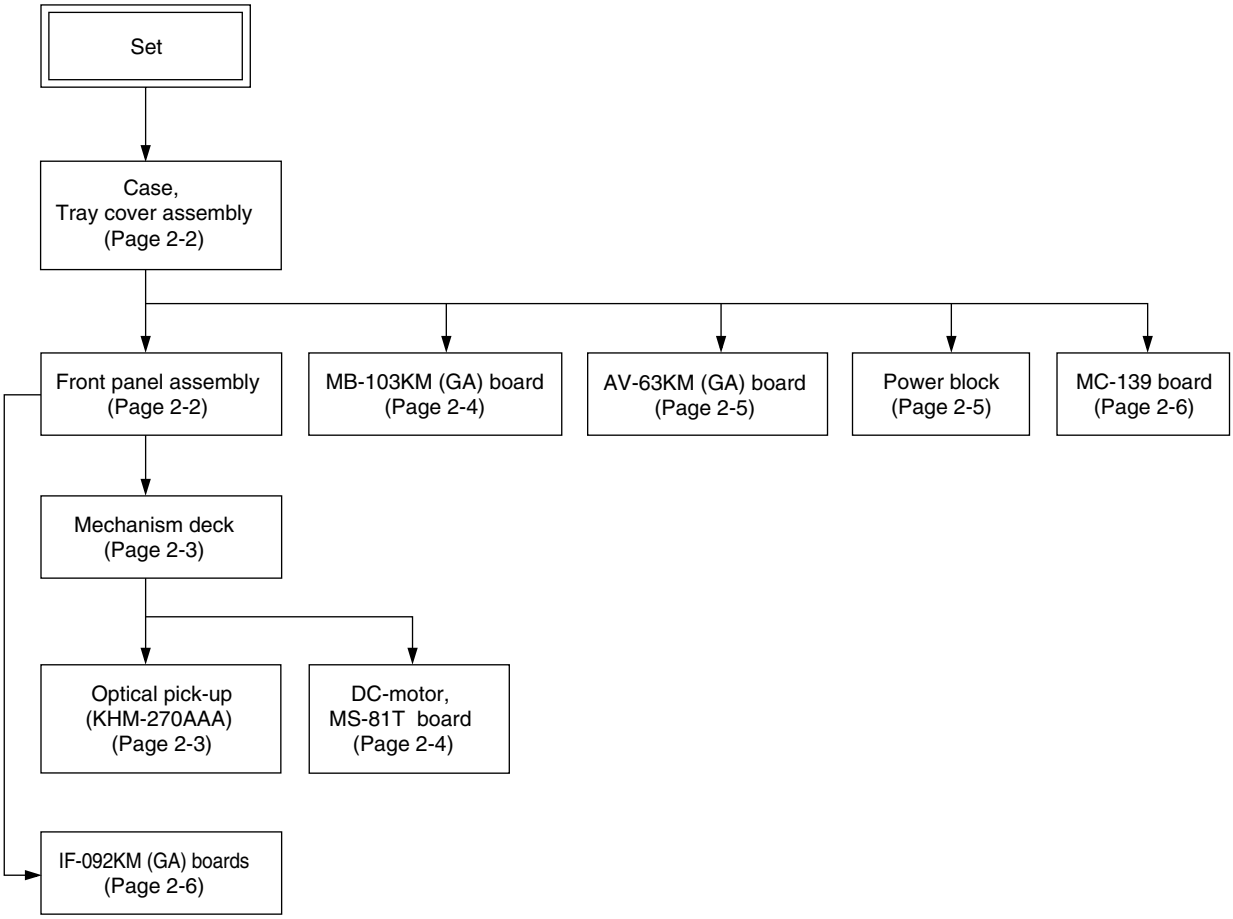
SECTION 2
DISASSEMBLY

NOTE: The following flow chart shows the disassembly procedure.



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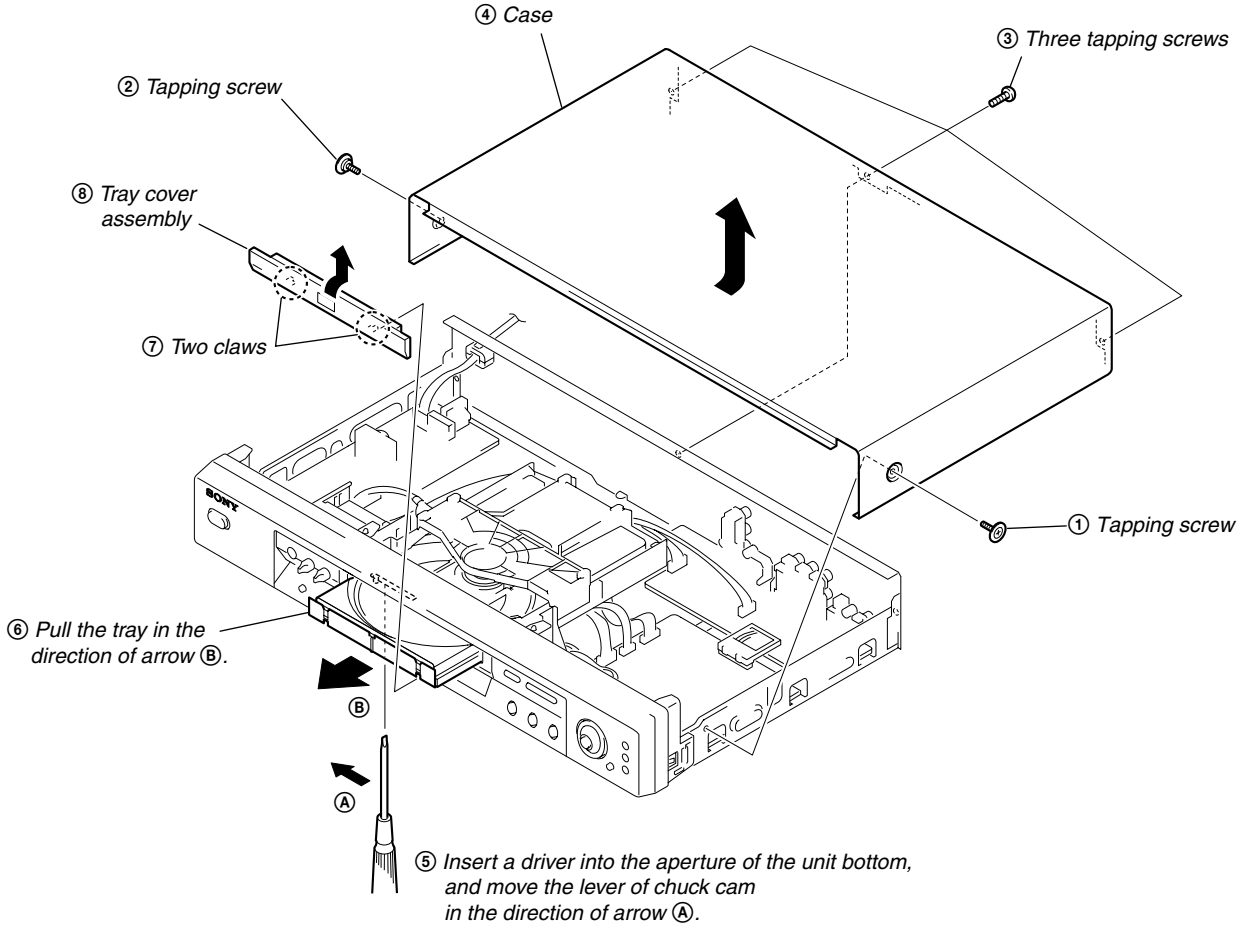
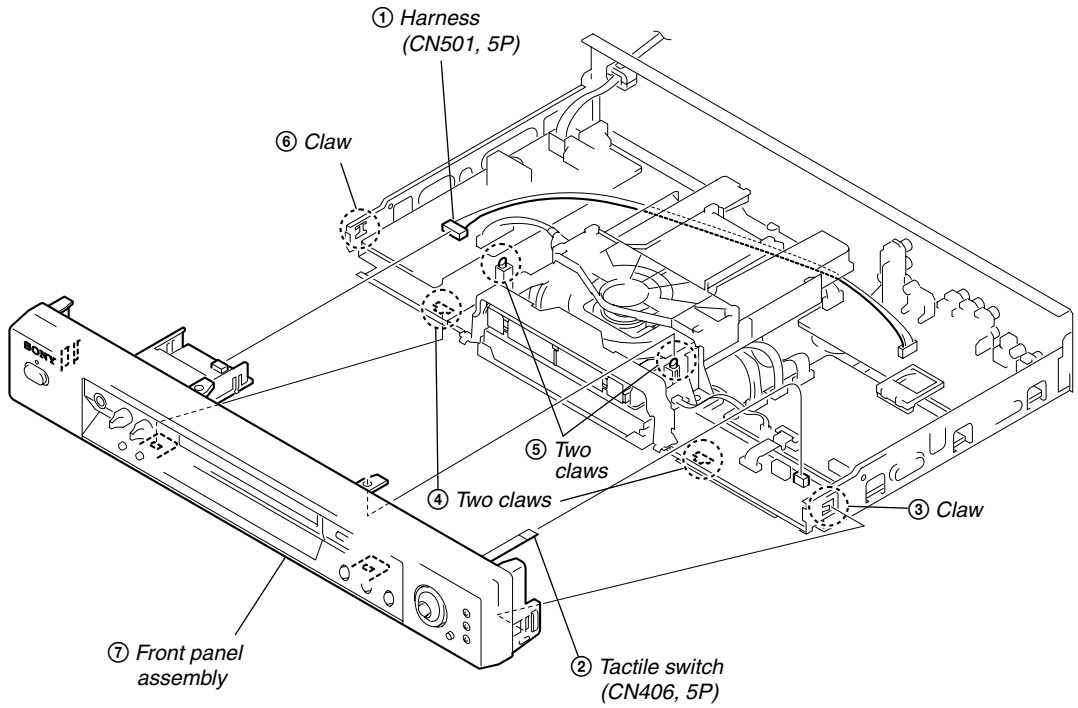
NOTE: Follow the disassembly procedure in the numerical order given.

2-1. CASE, TRAY COVER ASSEMBLY


④ Case
③ Three tapping screws
② Tapping screw
⑧ Tray cover assembly
⑦ Two claws
① Tapping screw
⑥ Pull the tray in the direction of arrow Ⓑ.
Ⓑ
Ⓐ
⑤ Insert a driver into the aperture of the unit bottom, and move the lever of chuck cam in the direction of arrow Ⓐ.

2-2. FRONT PANEL ASSEMBLY



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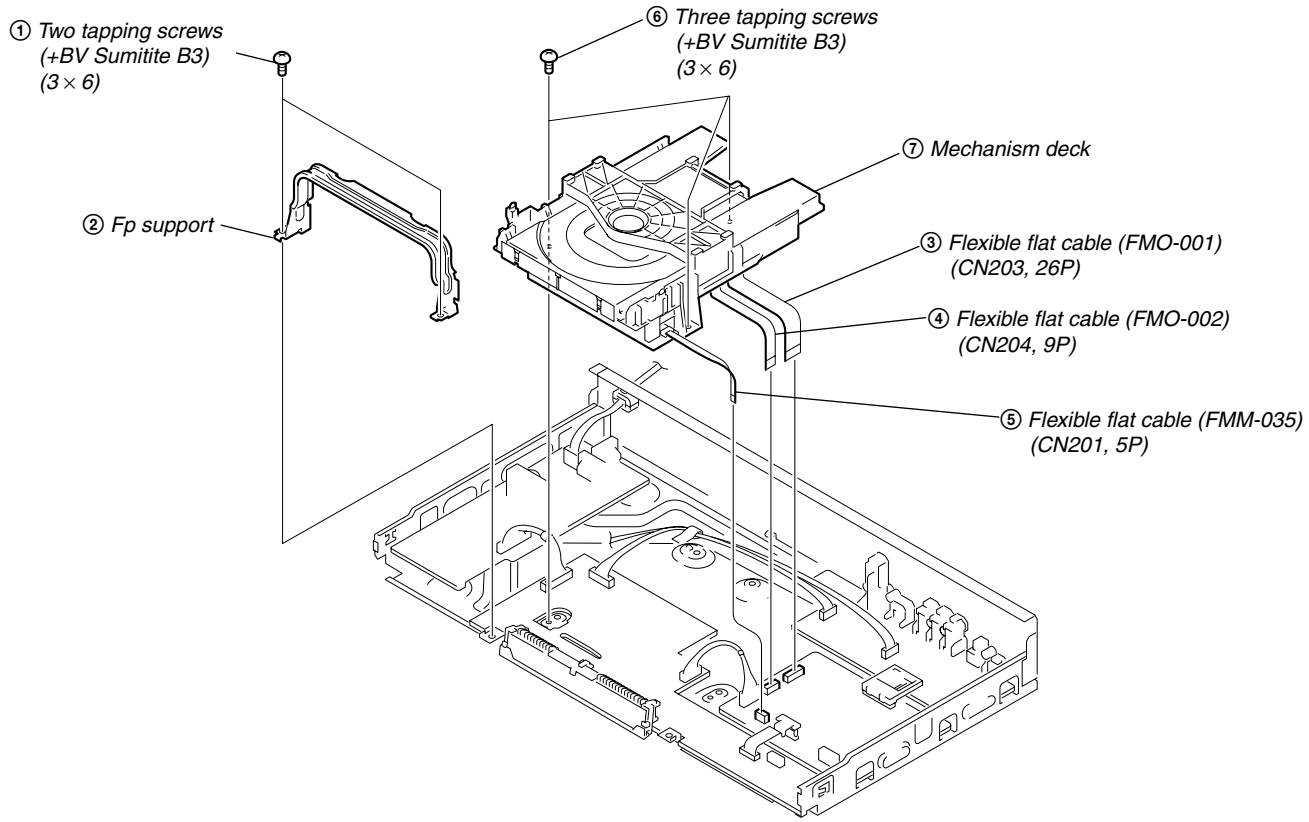
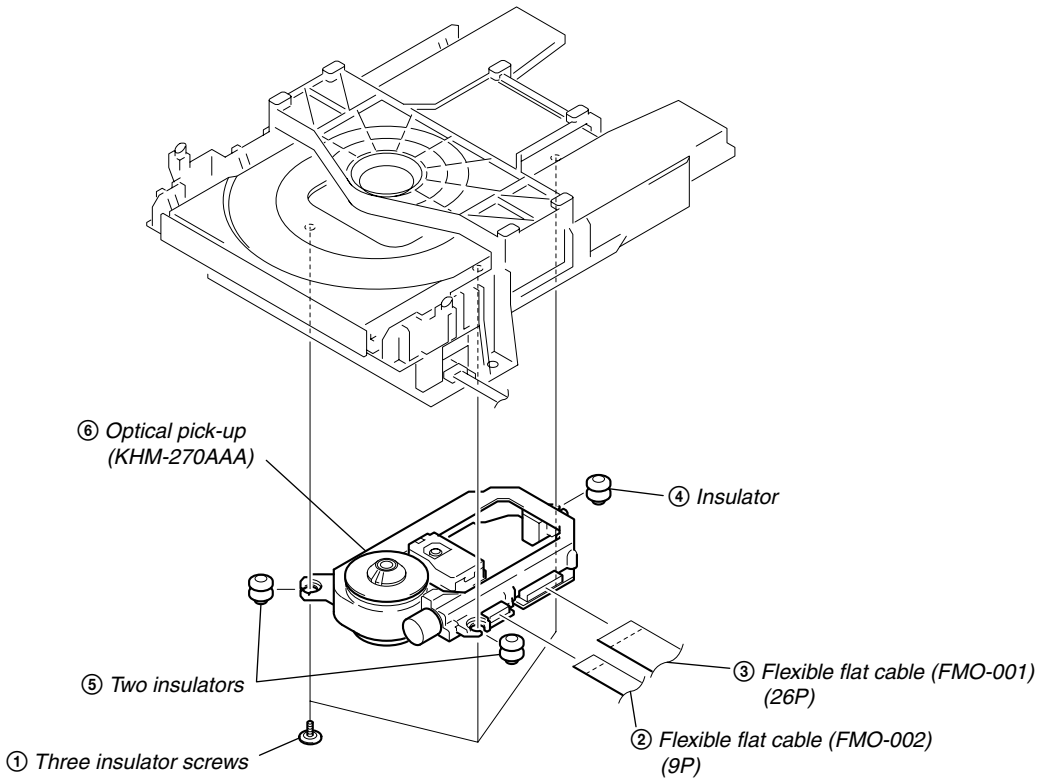
2-3. MECHANISM DECK



2-4. OPTICAL PICK-UP (KHM-270AAA)



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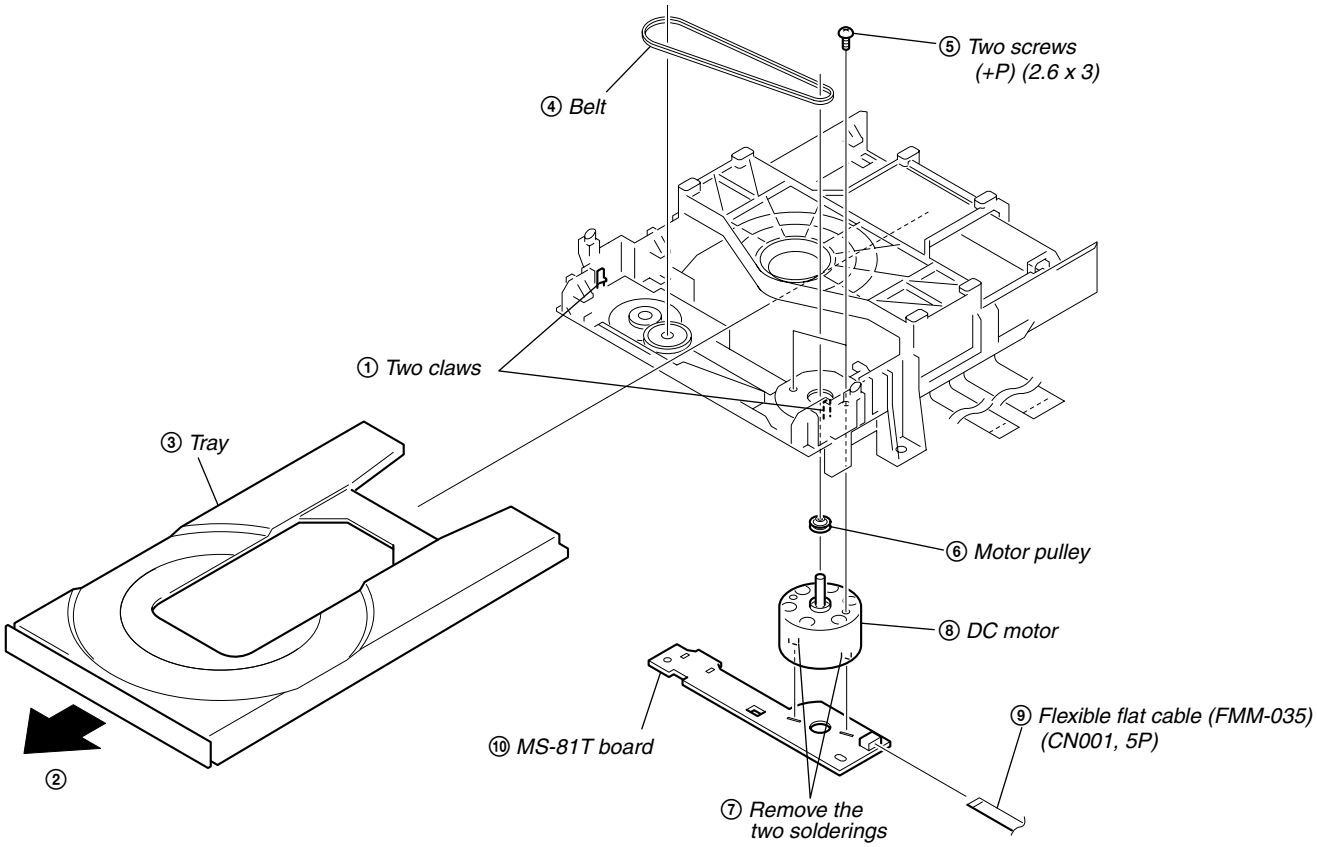
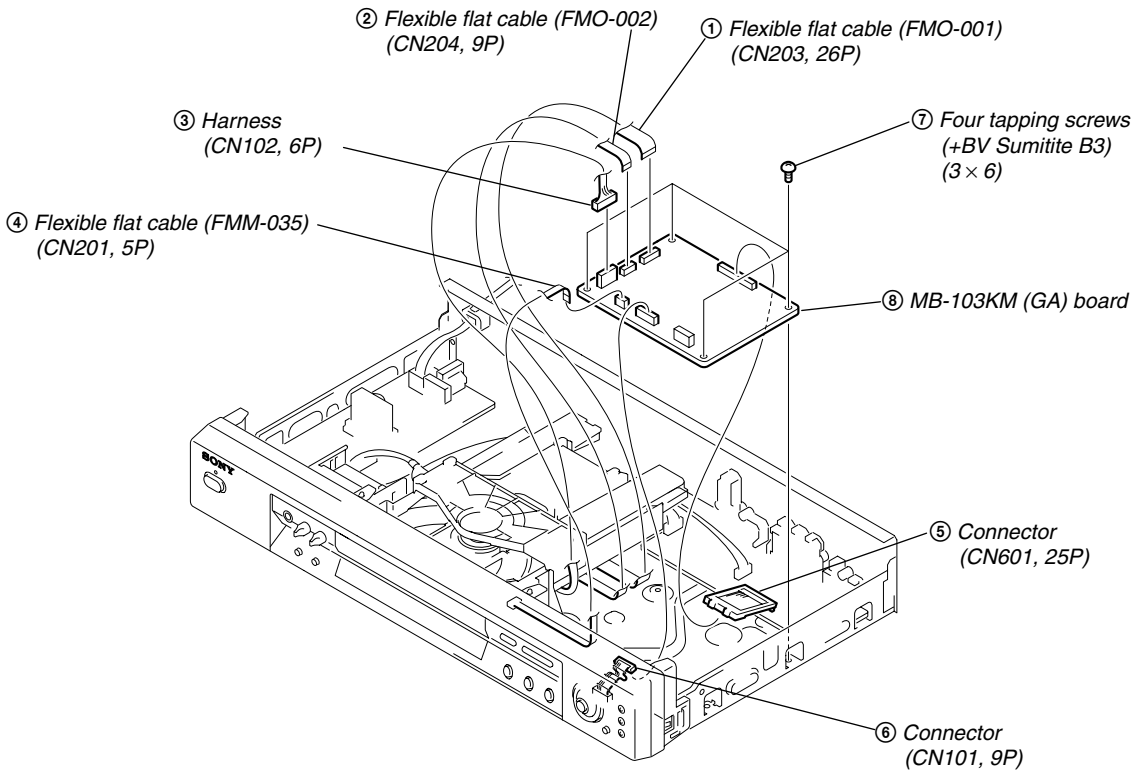
2-5. DC-MOTOR, MS-81T BOARD



2-6. MB-103KM (GA) BOARD



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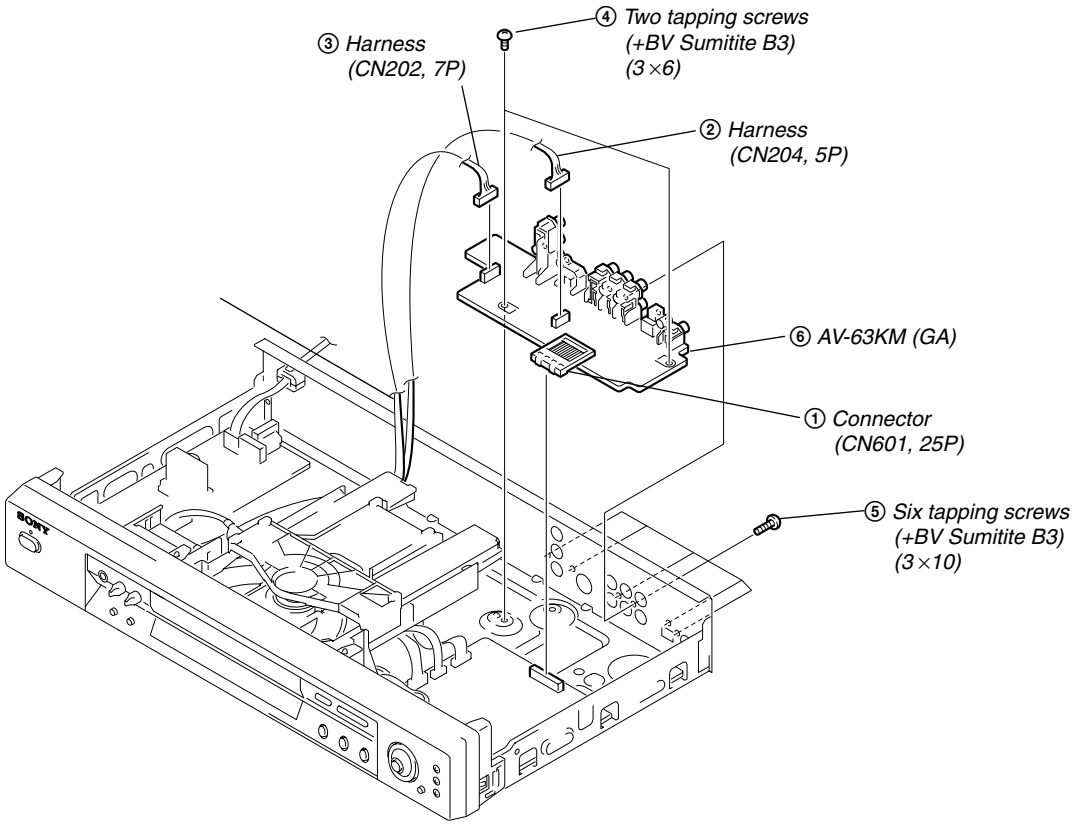
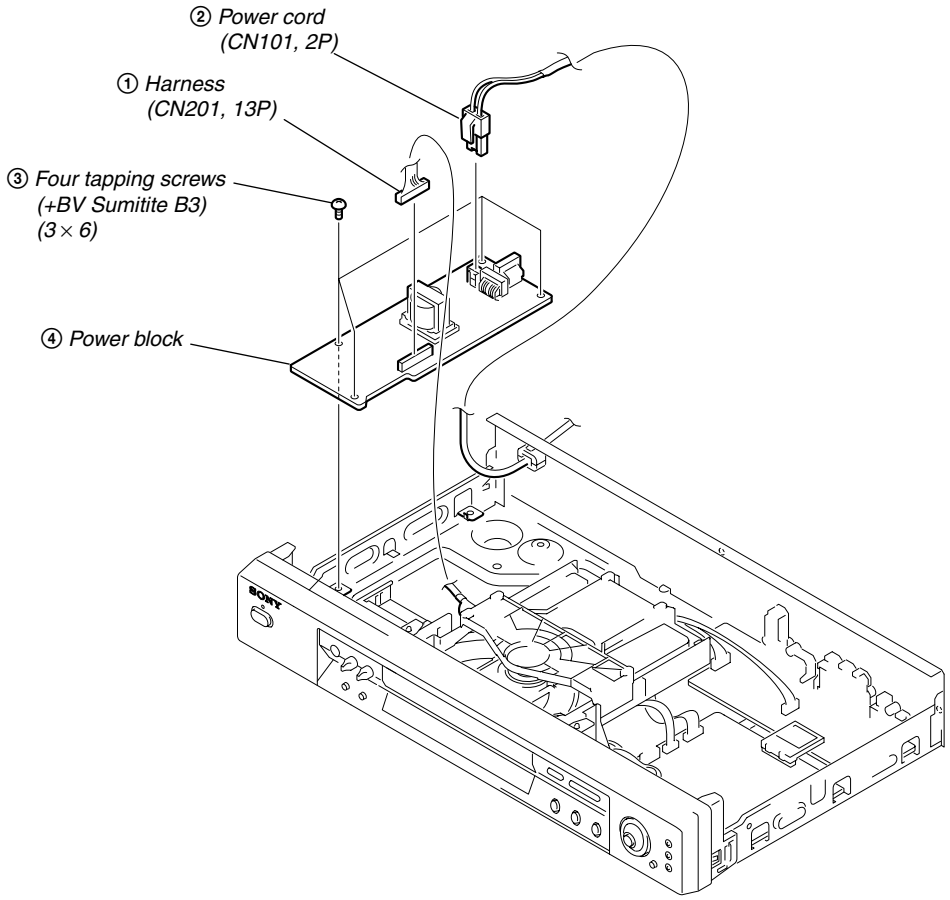
2-7. AV-63KM (GA) BOARD



2-8. POWER BLOCK



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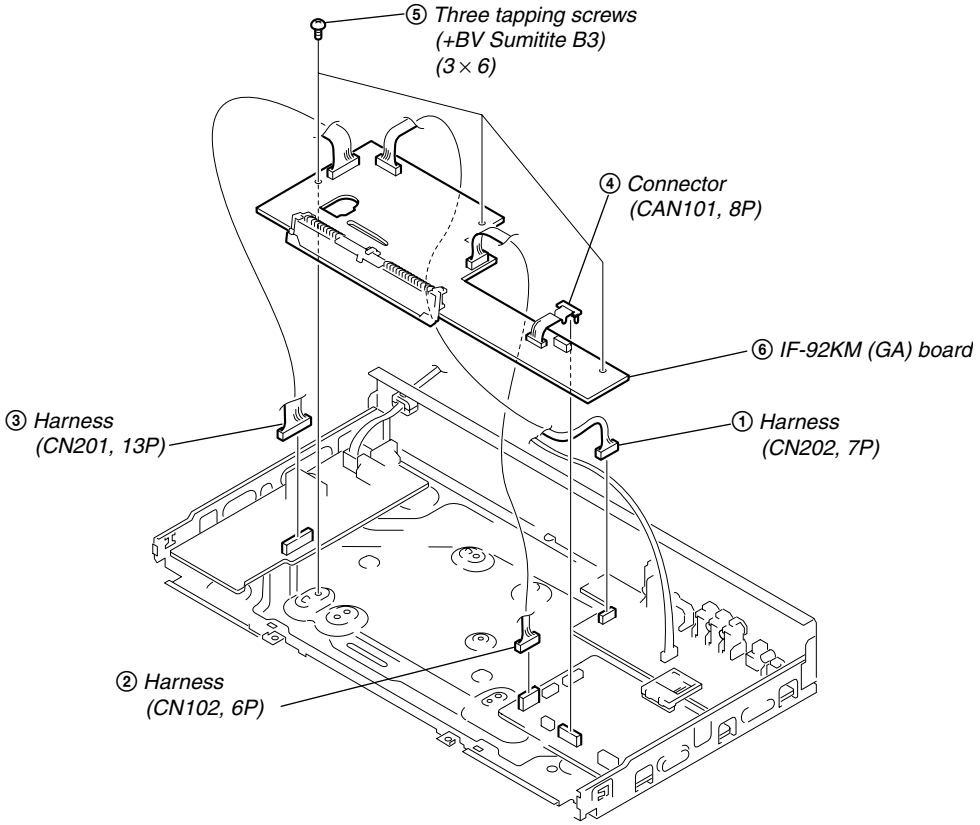
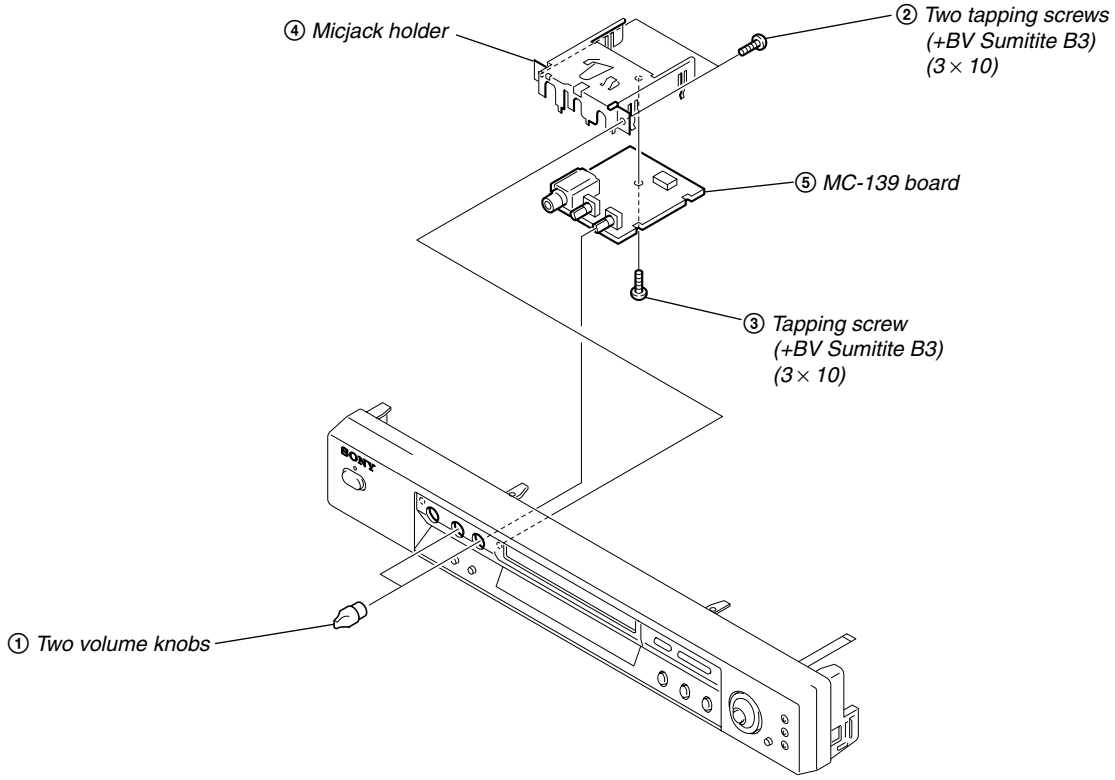
2-9. IF-092KM (GA) BOARD



2-10. MC-139 BOARD



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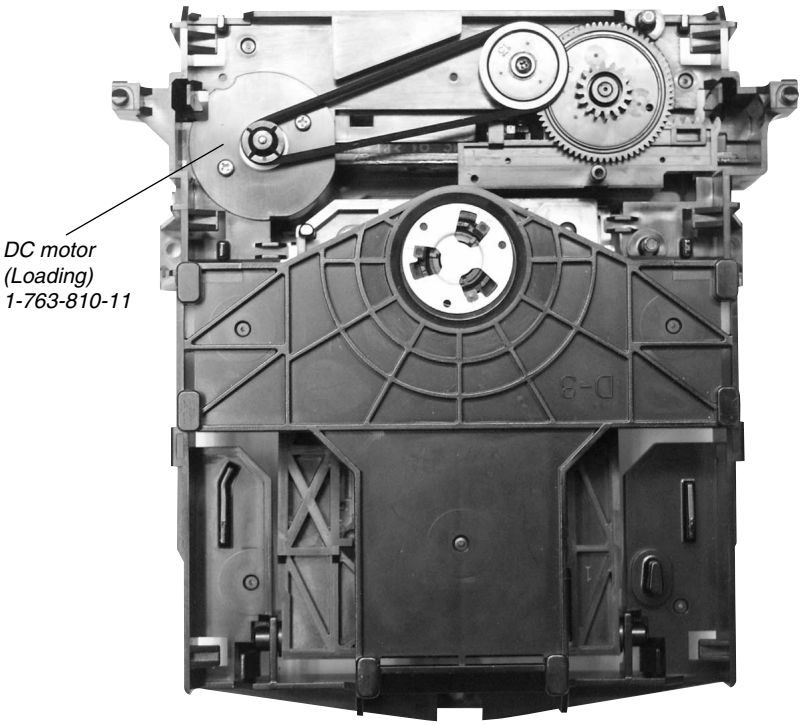
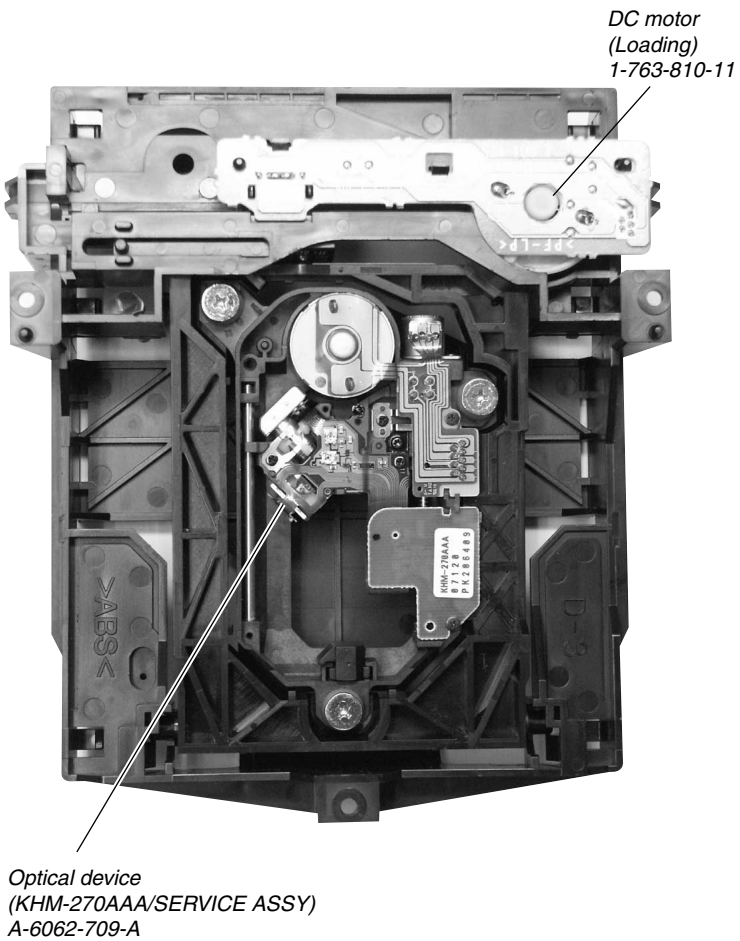
2-11. INTERNAL VIEWS





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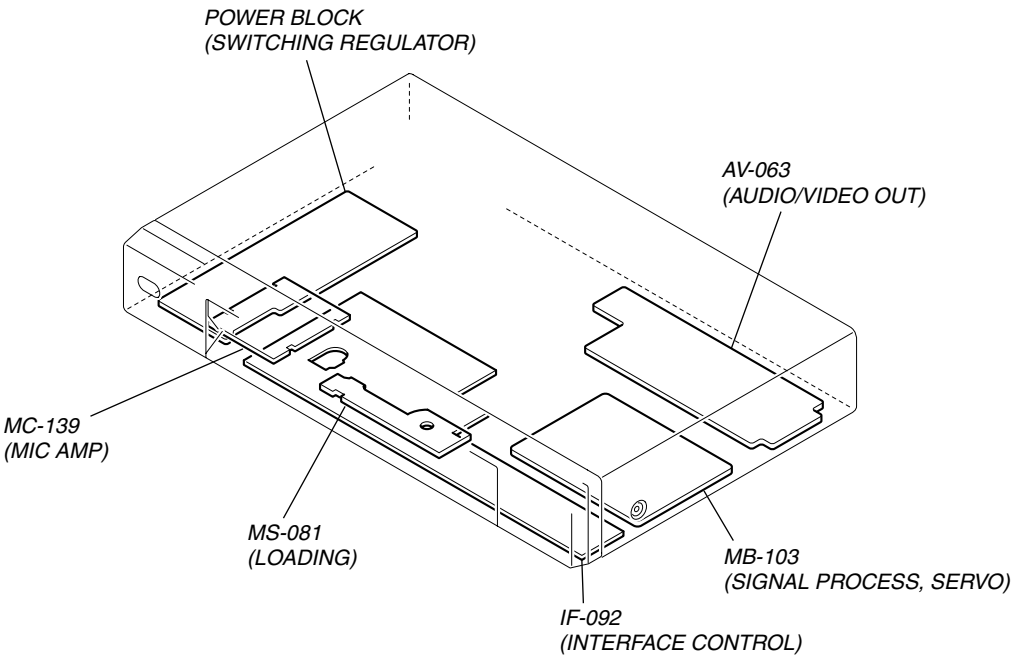
2-12. CIRCUIT BOARDS LOCATION



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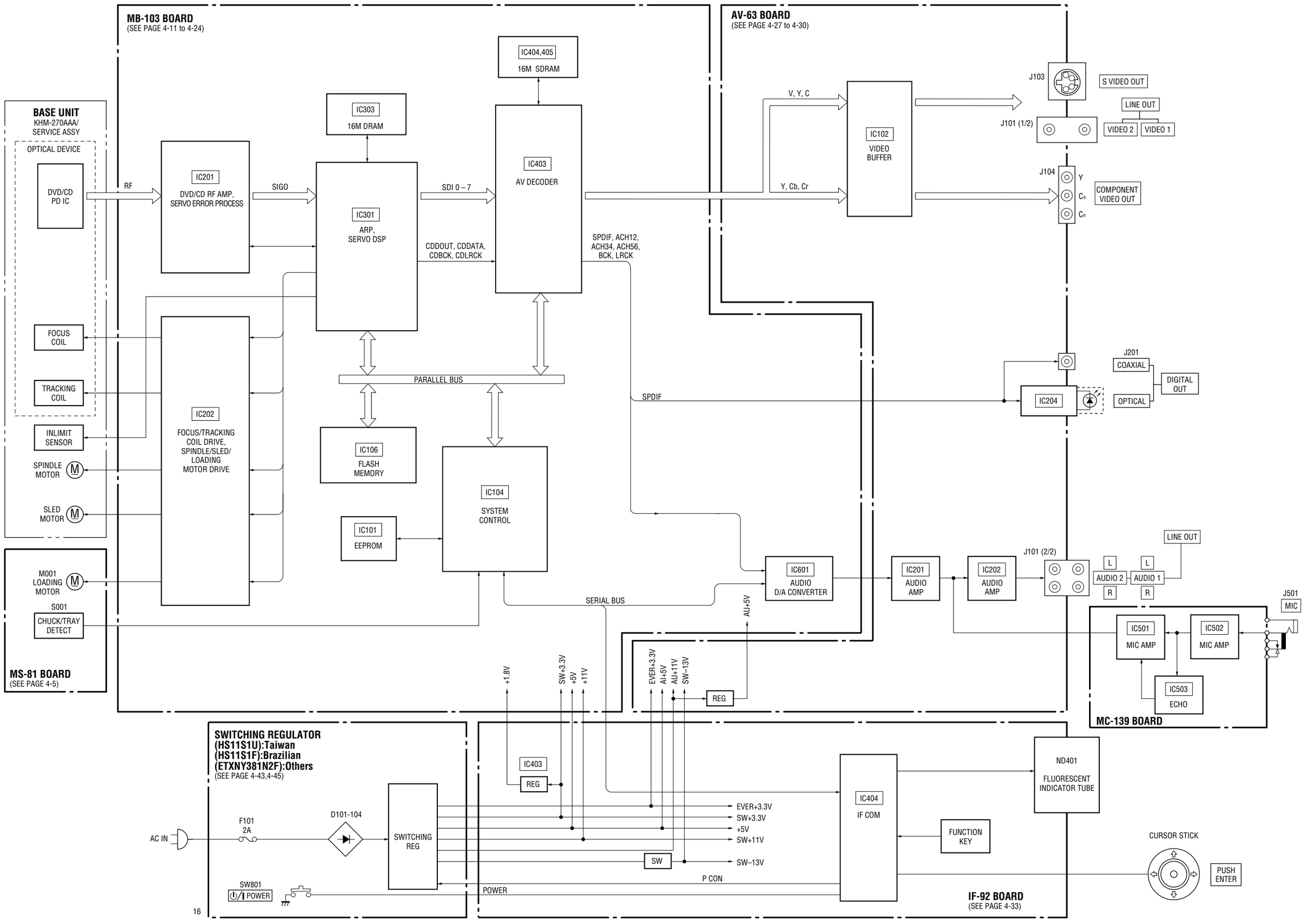
SECTION 3
BLOCK DIAGRAMS

3-1. OVERALL BLOCK DIAGRAM



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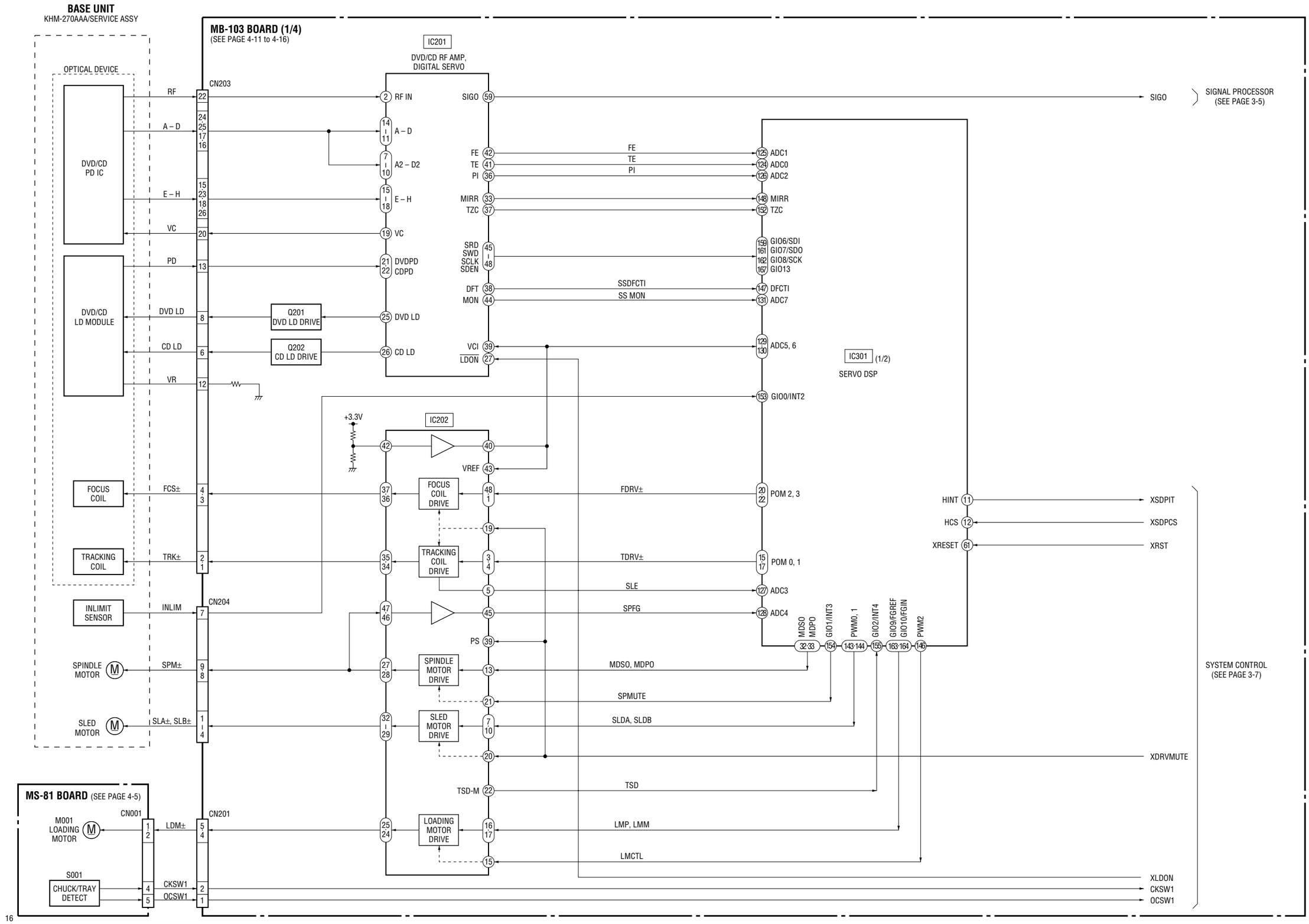
3-2. RF/SERVO BLOCK DIAGRAM



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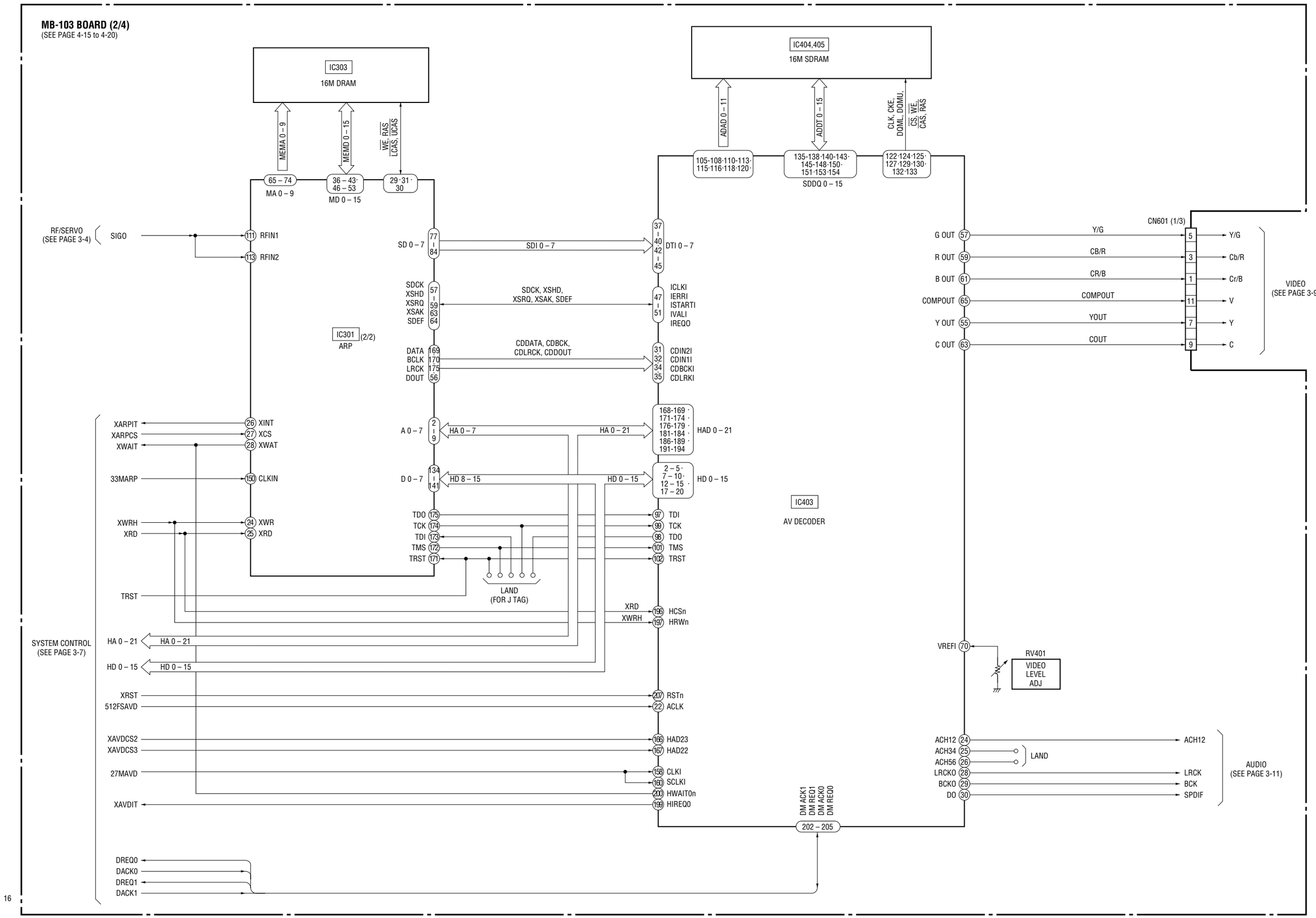
3-3. SIGNAL PROCESSOR BLOCK DIAGRAM



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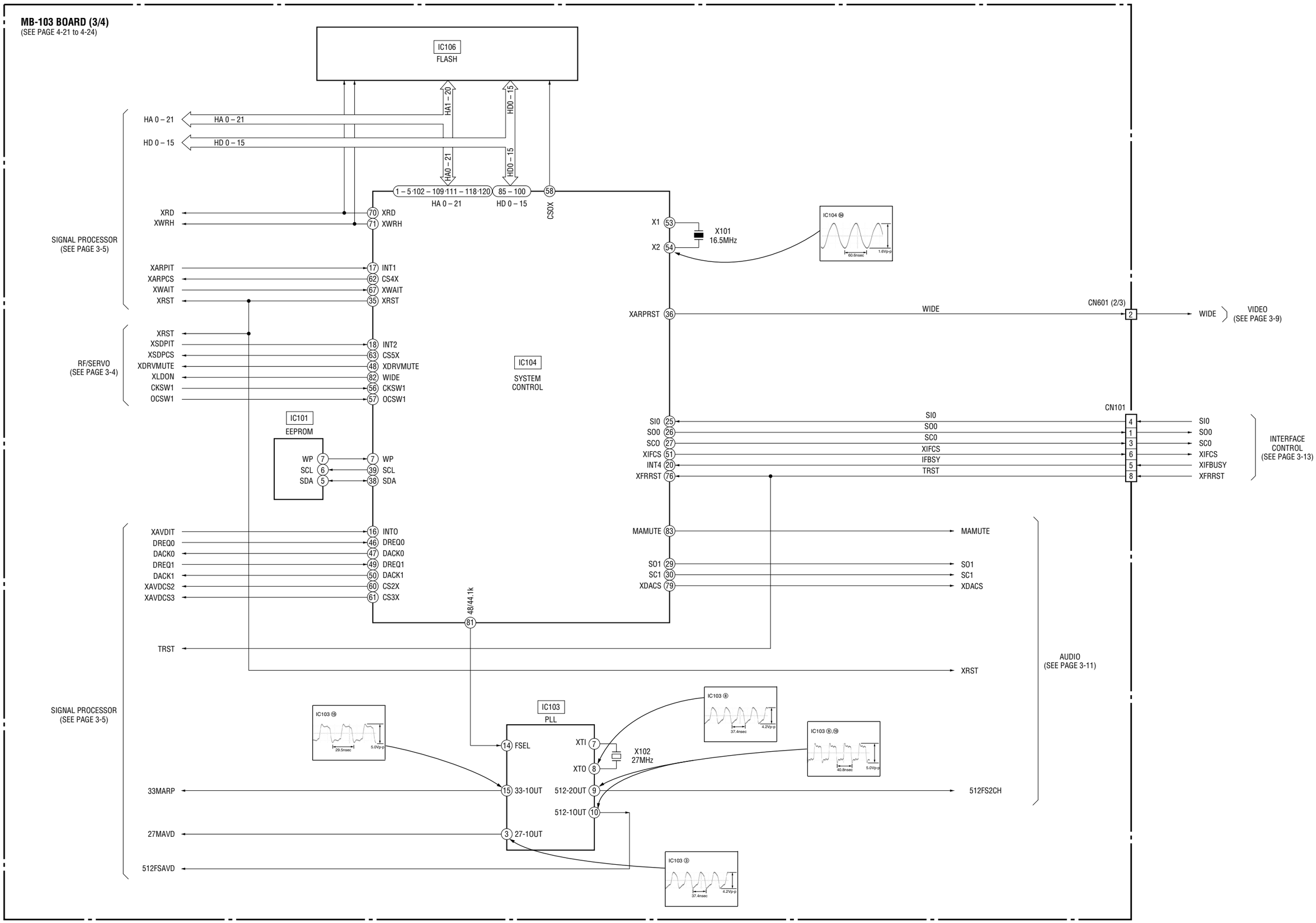
3-4. SYSTEM CONTROL BLOCK DIAGRAM



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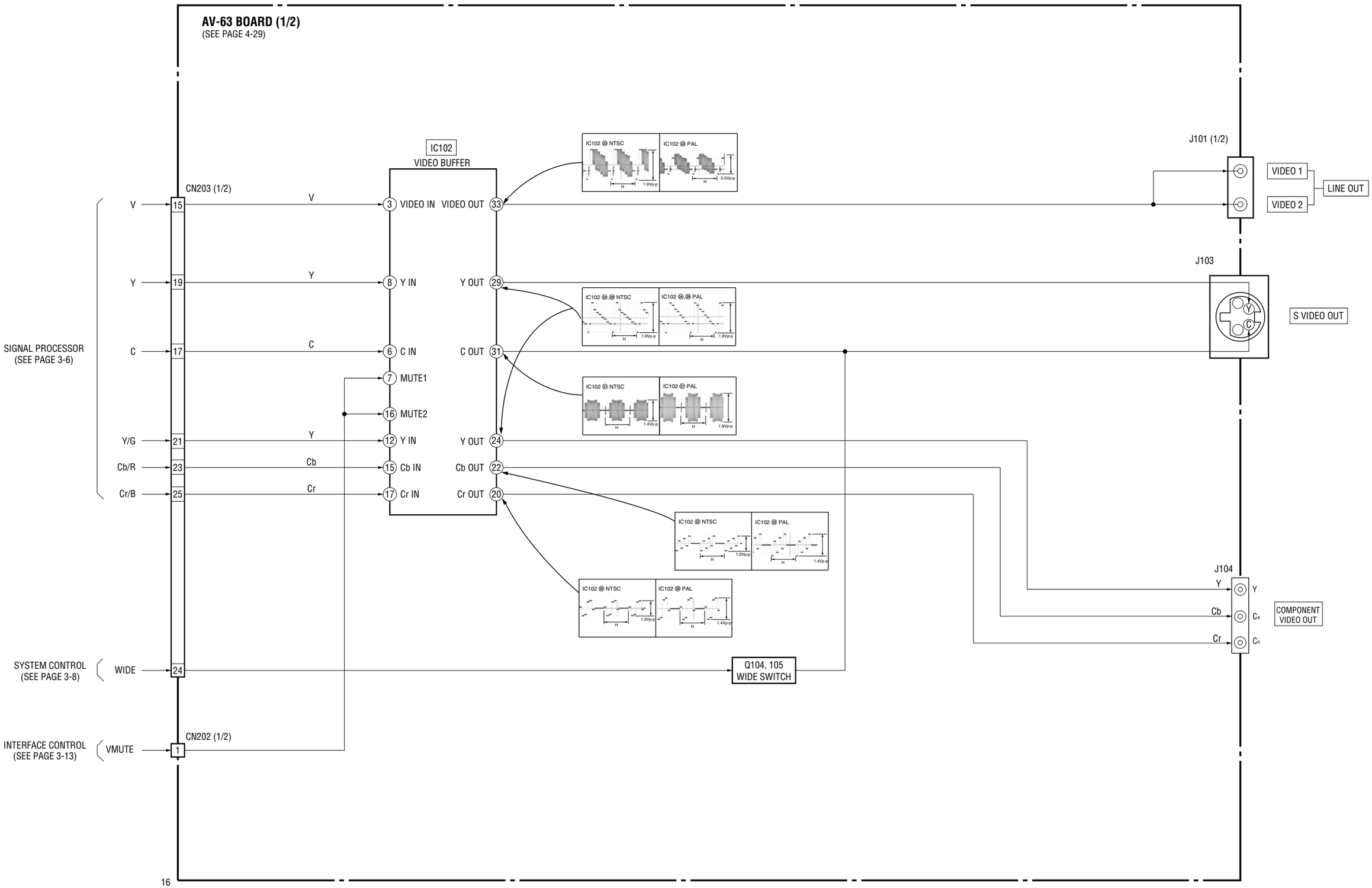
3-5. VIDEO BLOCK DIAGRAM



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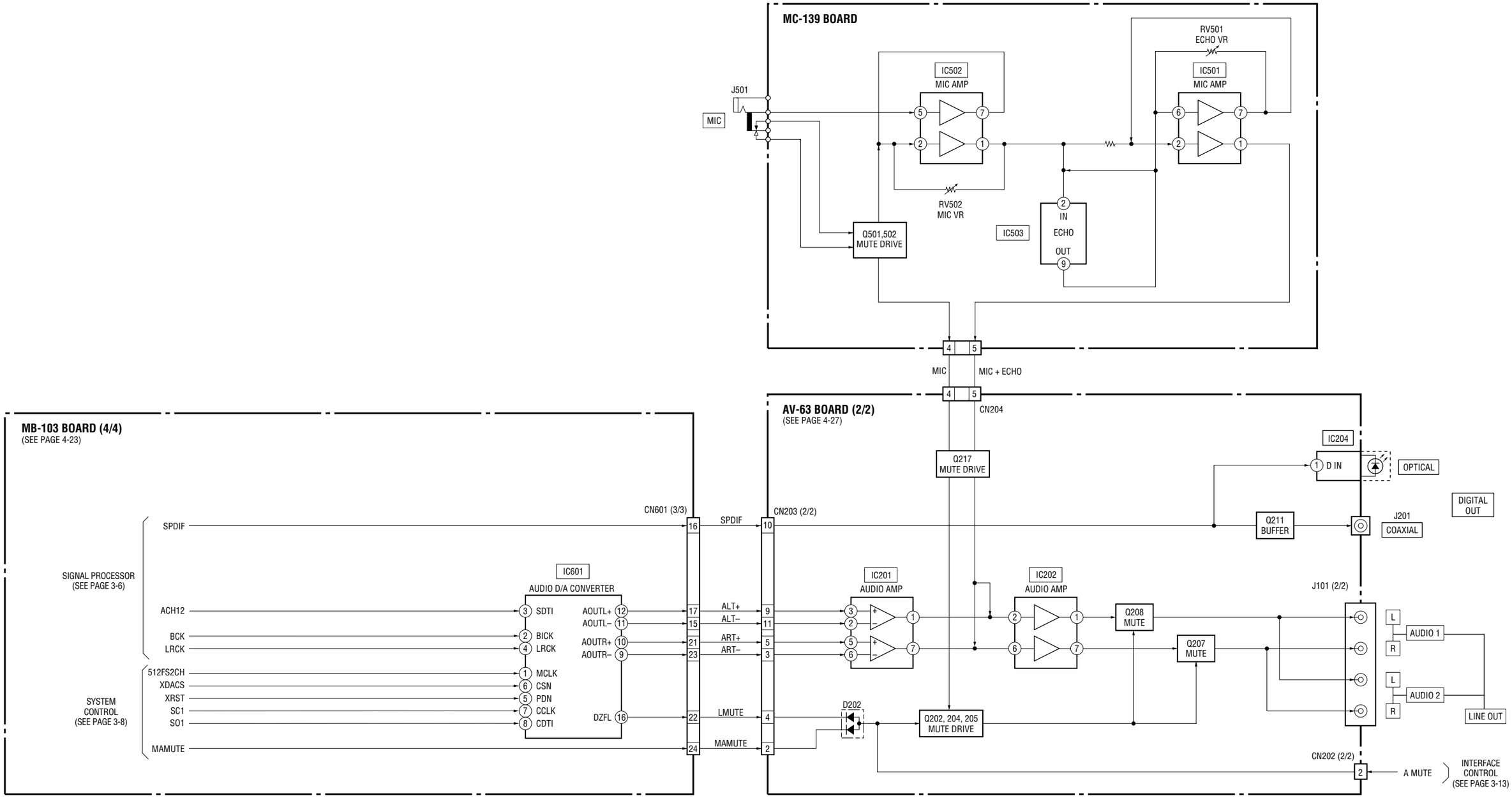
3-6. AUDIO BLOCK DIAGRAM



MB-103 BOARD (4/4)
(SEE PAGE 4-23)

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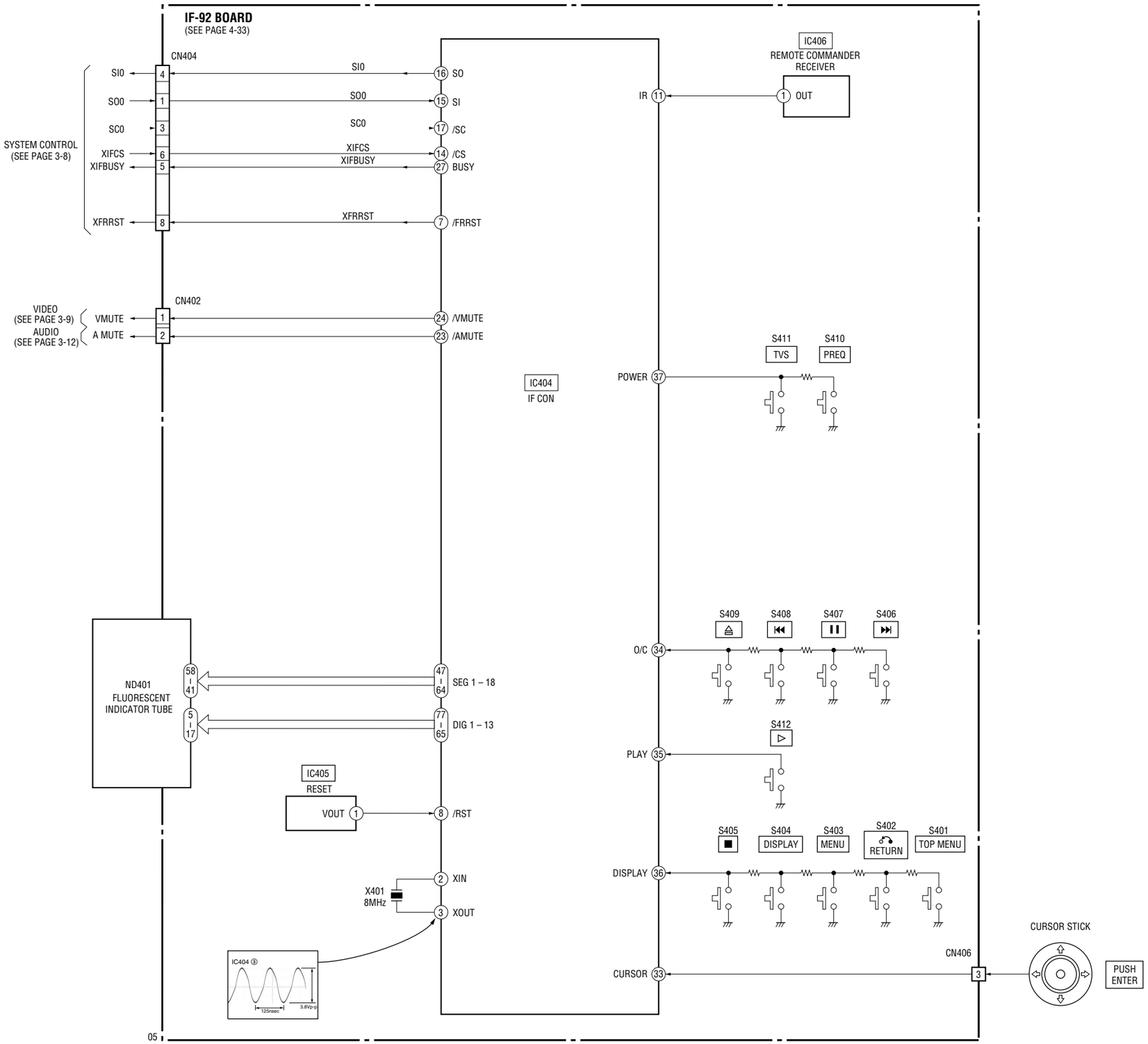
3-7. INTERFACE CONTROL BLOCK DIAGRAM



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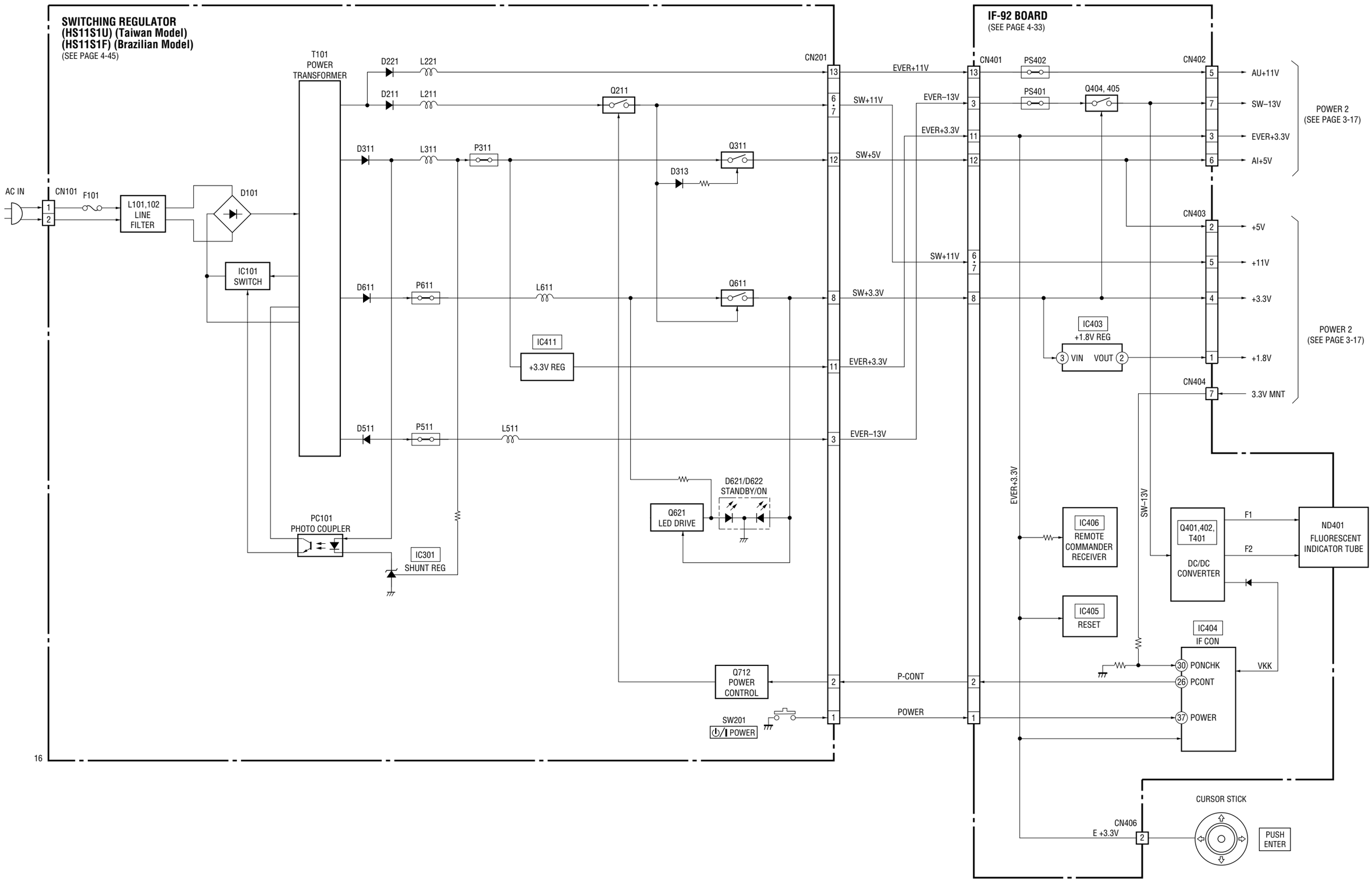
3-8. POWER BLOCK DIAGRAM (1/3)



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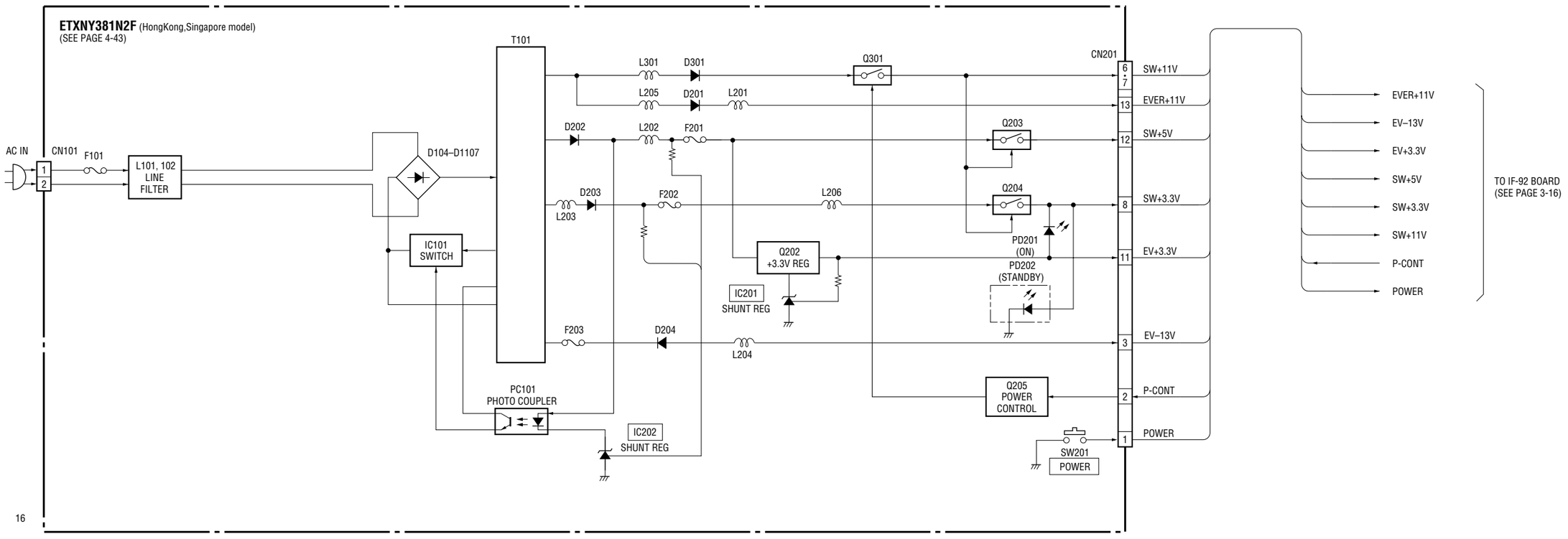
3-9. POWER BLOCK DIAGRAM (2/3)



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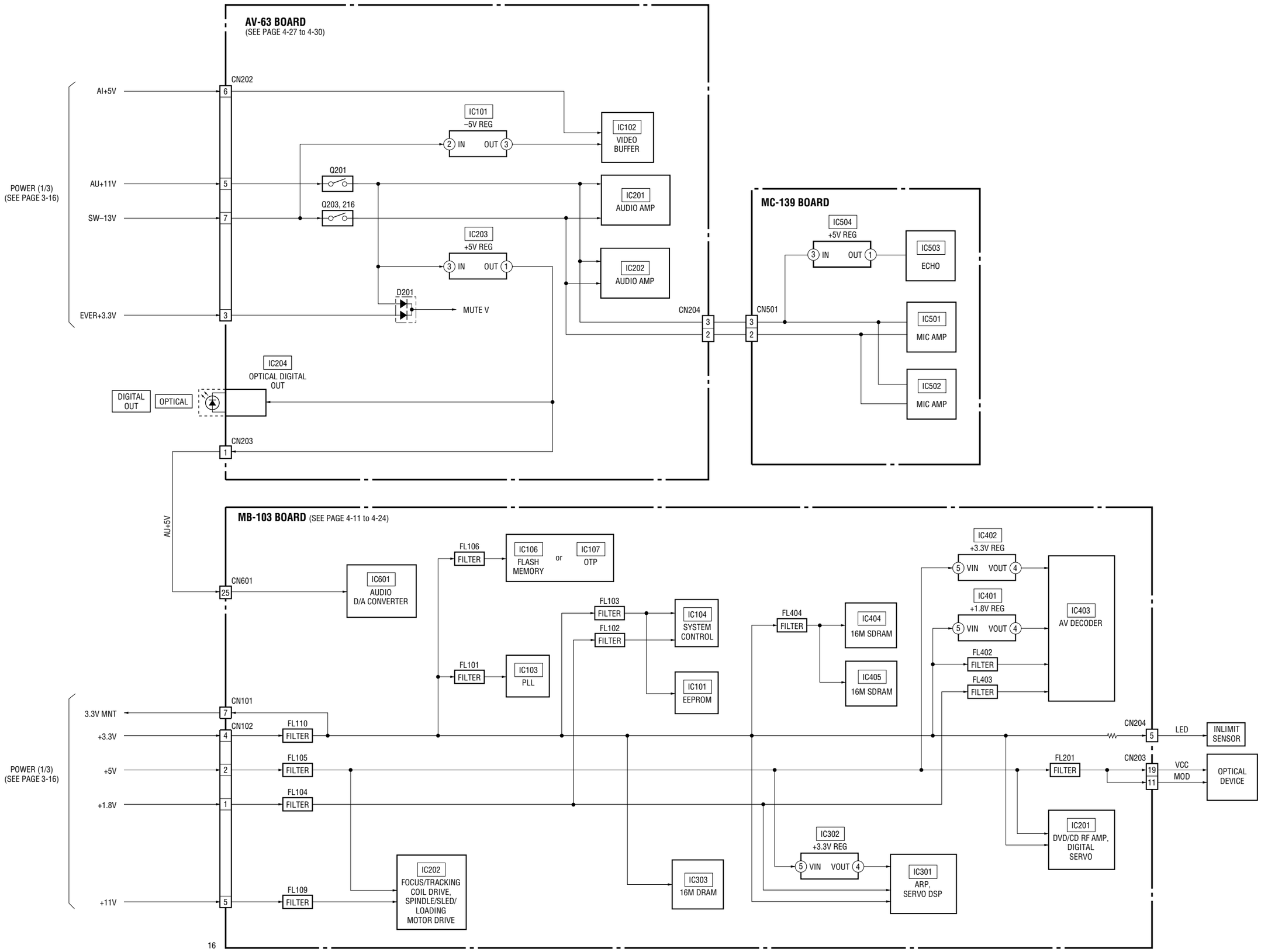
3-10. POWER BLOCK DIAGRAM (3/3)



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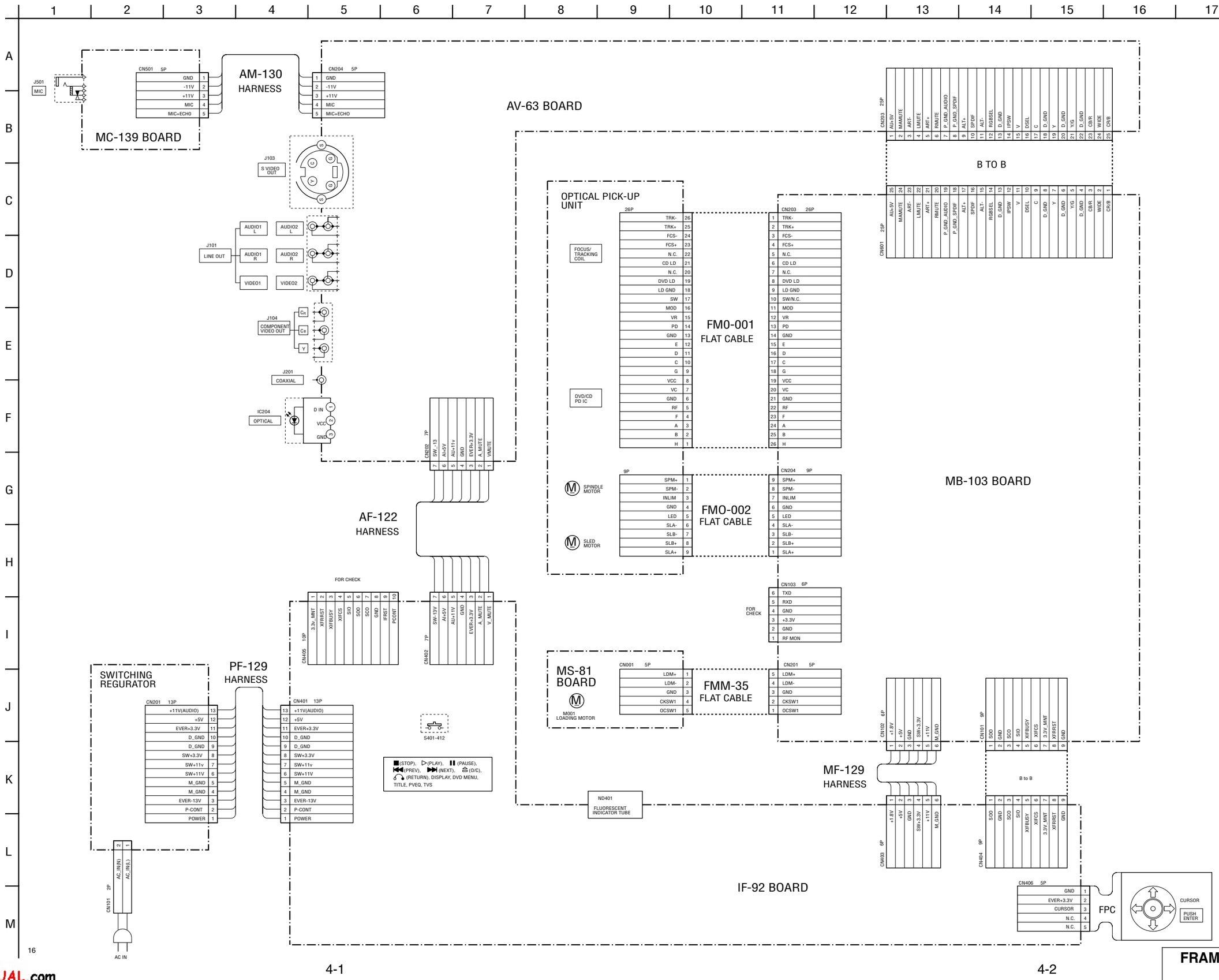
SECTION 4
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

4-1. FRAME SCHEMATIC DIAGRAM



4-1 4-2

FRAME SCHEMATIC DIAGRAM

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4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

THIS NOTE IS COMMON FOR WIRING BOARDS AND SCHEMATIC DIAGRAMS
(In addition to this, the necessary note is printed in each block)

(For printed wiring boards)

- ○——— : indicates a lead wire mounted on the component side.
- ●——— : indicates a lead wire mounted on the printed side.
- ○ : Through hole.
- ▒▒▒ : Pattern from the side which enables seeing.
  (The other layers' patterns are not indicated.)

Caution:
Pattern face side: (Side B) Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Side A) Parts on the parts face side seen from the parts face are indicated.

- Abbreviation
  BR : Brazilian model
  E:HK ; Hong Kong model
  E:TW ; Taiwan model
  E:SP ; Singapore model
  ; Malaysia model
  ; Thailand model
  ; Philippine model
  ; Indonesia model
  ; Vietnum model

(For schematic diagrams)

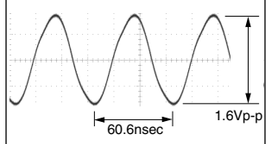
- All capacitors are in µF unless otherwise noted. pF : µµF. 50V or less are not indicated except for electrolytics and tantalums.
- All resistors are in ohms, 1/4 W (Chip resistors : 1 /10 W) un-less otherwise specified.
  kΩ=1000Ω, MΩ=1000kΩ.
- Caution when replacing chip parts.
  New parts must be attached after removal of chip.
  Be careful not to heat the minus side of tantalum capacitor, be-cause it is damaged by the heat.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- : non flammable resistor
- : fusible resistor
- : panel designation
- △ : internal component.
- : adjustment for repair.
- B + : B+ Line
- B − : B– Line
- Circled numbers refer to waveforms.
- Voltages are dc between measurement point.
- Readings are taken with a color-bar signals on DVD refer-ence disc and when playing CD reference disc.
- Readings are taken with a digital multimeter (DC 10MW).
- Voltage variations may be noted due to normal production toler-ances.

Note : The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

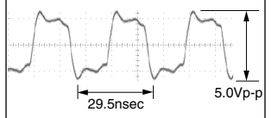
When indicating parts by reference number, please include the board name.

MB-103 BOARD

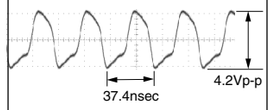
① IC104 ㊹



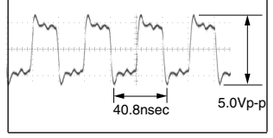
② IC103 ⑬,⑮



③ IC103 ③,⑧



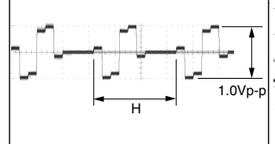
④ IC103 ⑨,⑩



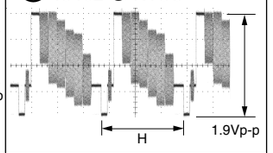
AV-63 BOARD

NTSC:75% COLOR BAR PLAY BACK
PAL :100% COLOR BAR PLAY BACK

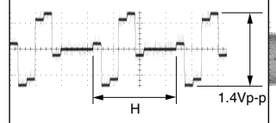
① IC102 ⑳ NTSC



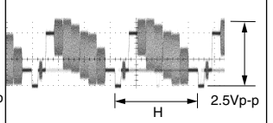
⑤ IC102 ㉝ NTSC



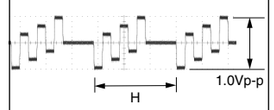
① IC102 ⑳ PAL



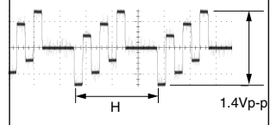
⑤ IC102 ㉝ PAL



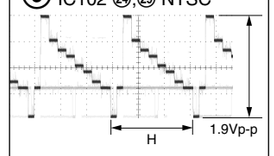
② IC102 ㉒ NTSC



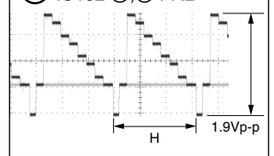
② IC102 ㉒ PAL



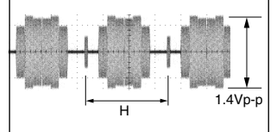
③ IC102 ㉔,㉙ NTSC



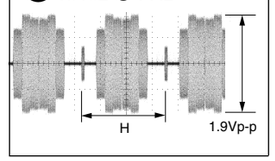
③ IC102 ㉔,㉙ PAL



④ IC102 ㉛ NTSC

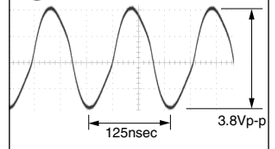


④ IC102 ㉛ PAL

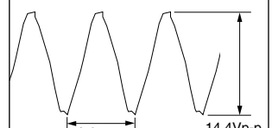


IF-92 BOARD

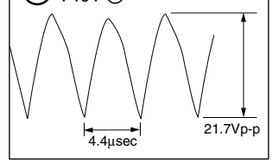
① IC404 ③



② ND401 ①,㊷



③ T401 ③



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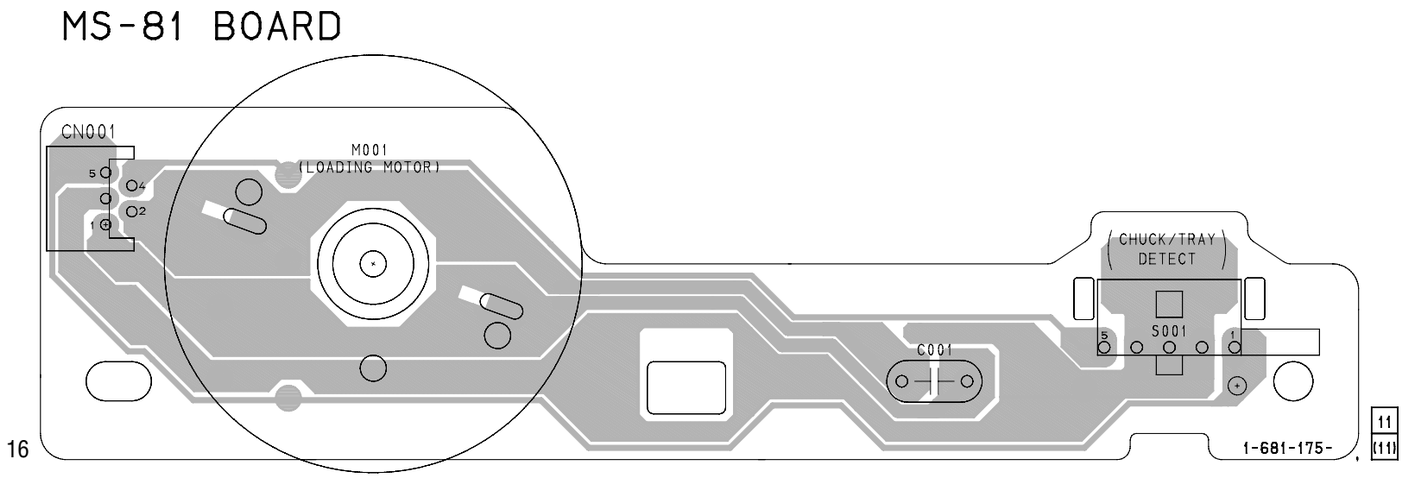
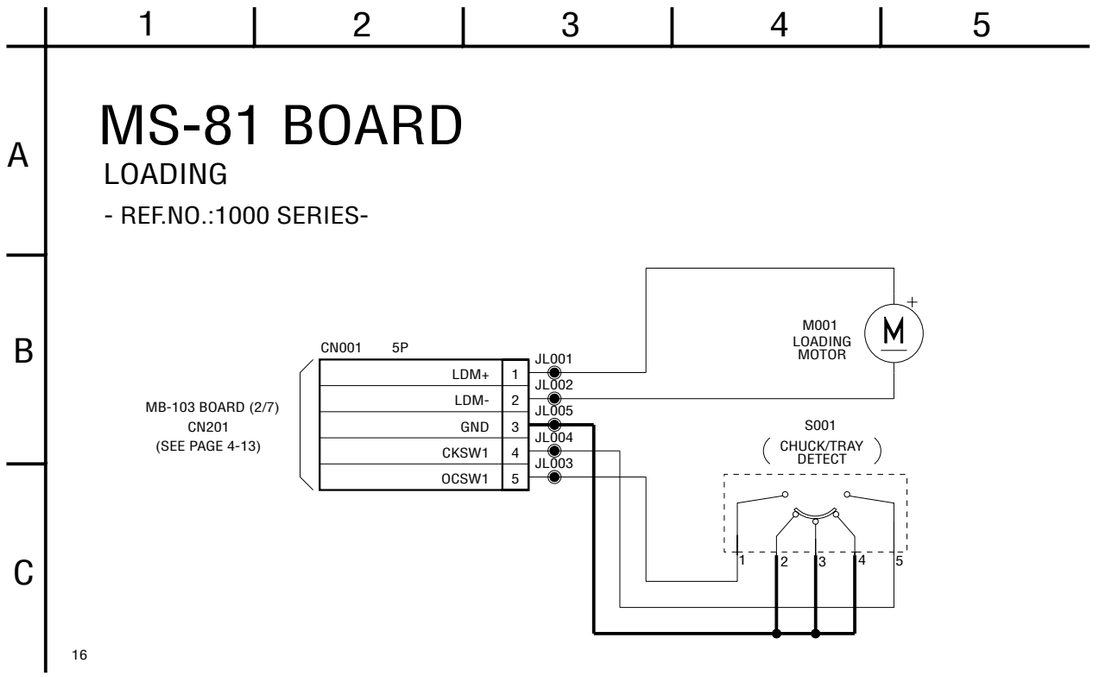
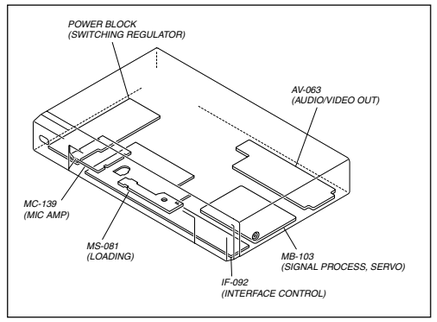
MS-81 (LOADING) PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM





For printed wiring board

There are a few cases that the part printed on this diagram isn't mounted in this model.



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MB-103 (DVD/CD RF AMP, DIGITAL SERVO, MOTOR DRIVE, SERVO, AV DECODER, SDRAM, SYSTEM CONTROL, AUDIO DAC, PLL) PRINTED WIRING BOARD

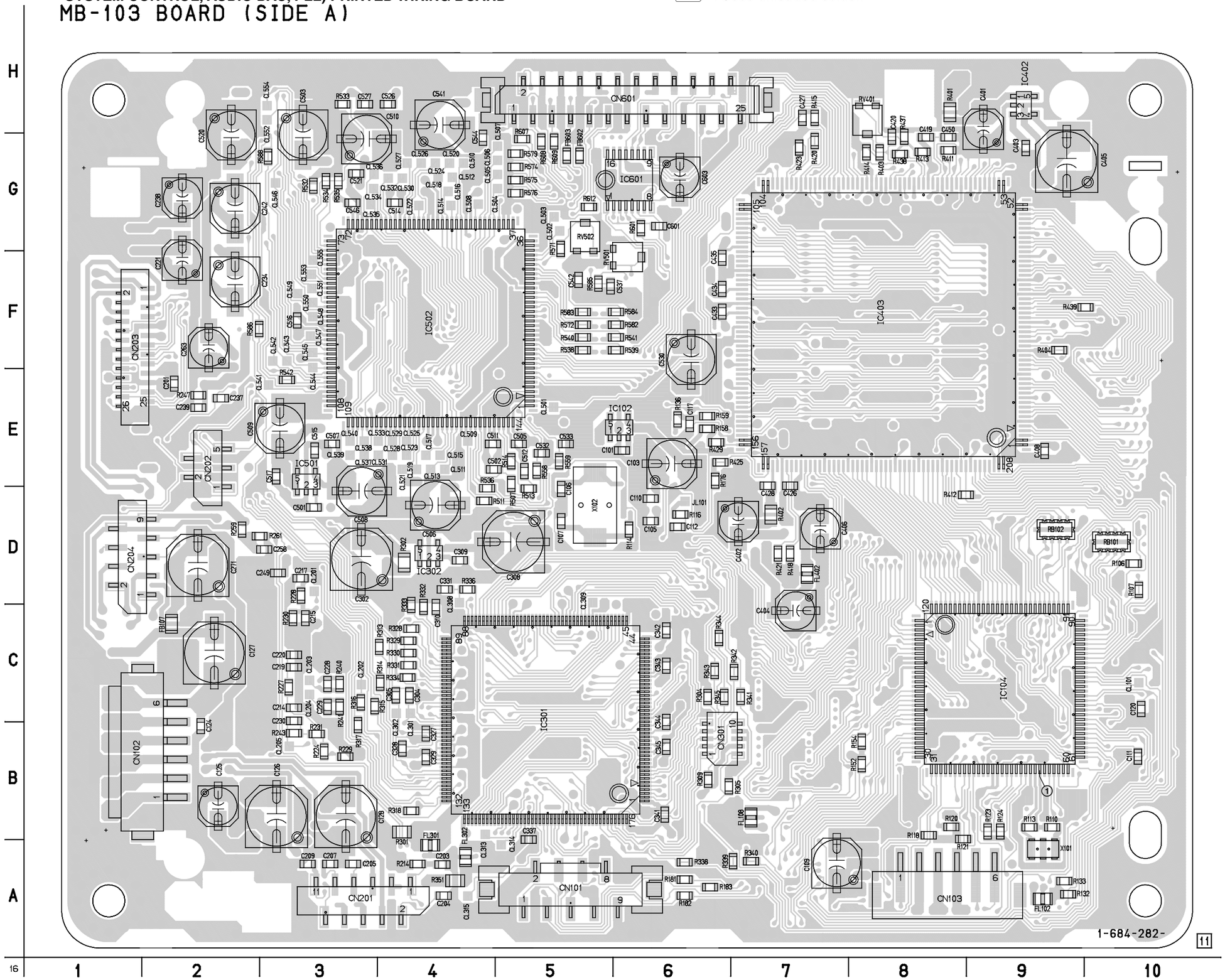
• LF : Uses unleaded solder.

MB-103 BOARD (SIDE A)

CN101 A-5
CN102 B-1
CN103 A-8
CN201 A-3
CN202 E-2
CN203 F-1
CN204 D-1
CN301 B-6
CN601 H-6

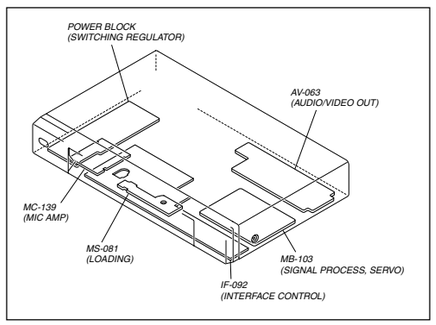
IC102 E-6
IC104 C-9
IC301 B-5
IC302 D-4
IC402 H-9
IC403 F-8
IC501 E-3
IC502 F-4
IC601 G-6

RV401 H-8
RV501 F-6
RV502 G-5



For printed wiring board

There are a few cases that the part printed on this diagram isn't mounted in this model.



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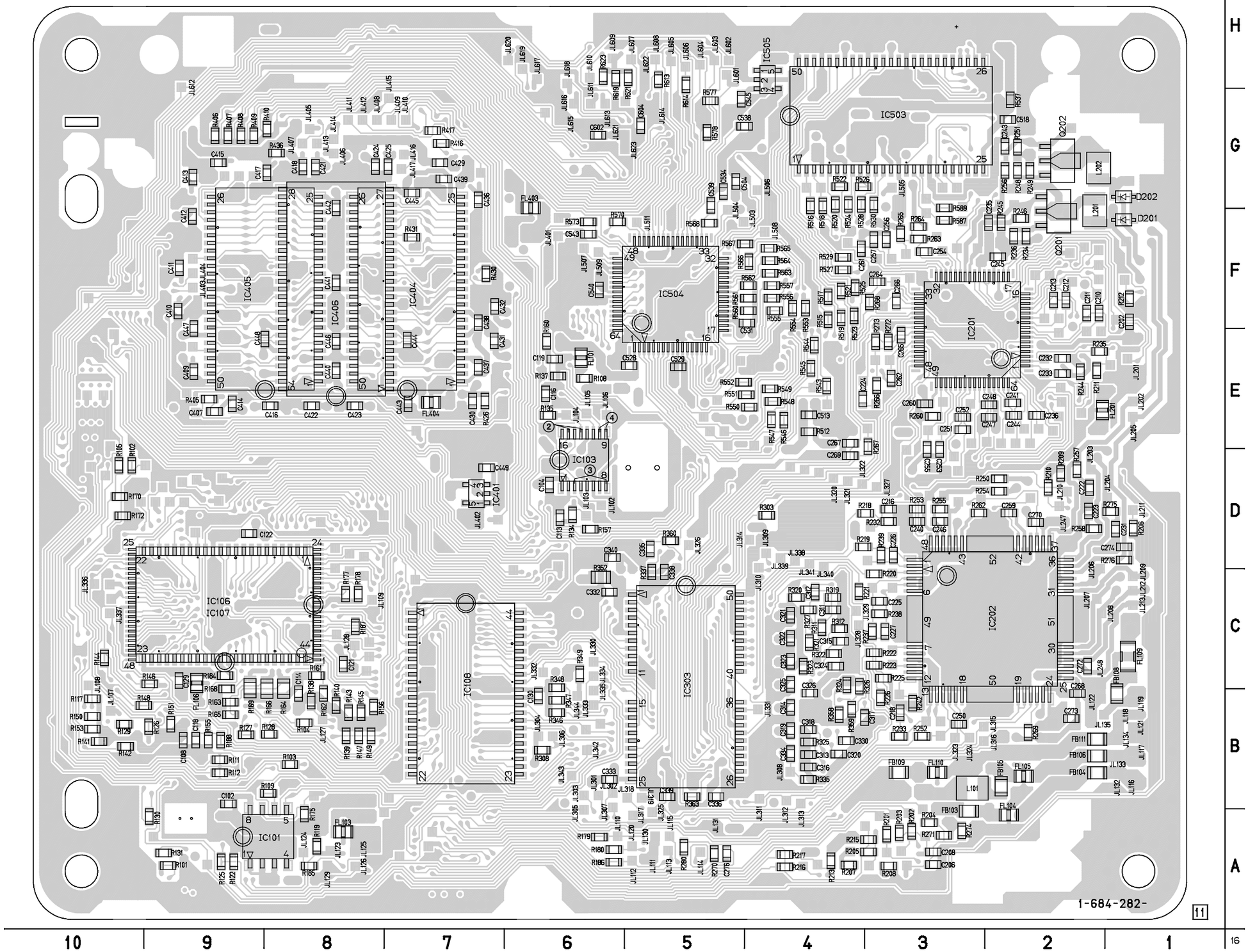
• : Uses unleaded solder.

MB-103 BOARD (SIDE B)



MB-103 BOARD (SIDE B)

D201	F-1
D202	G-1
IC101	A-8
IC103	D-6
IC106	C-9
IC107	C-9
IC108	C-7
IC201	E-3
IC202	C-2
IC303	C-5
IC401	D-7
IC404	F-7
IC405	F-9
IC406	F-8
IC503	G-3
IC504	F-5
IC505	H-4
Q201	F-2
Q202	G-2

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For Schematic Diagram

• Refer to page 4-7 for printed wiring board.

MB-103 BOARD(1/7)

DVD/CD RF AMP DIGITAL SERVO

-REF.NO.:1000 SERIES-
XX MARK:NO MOUNT

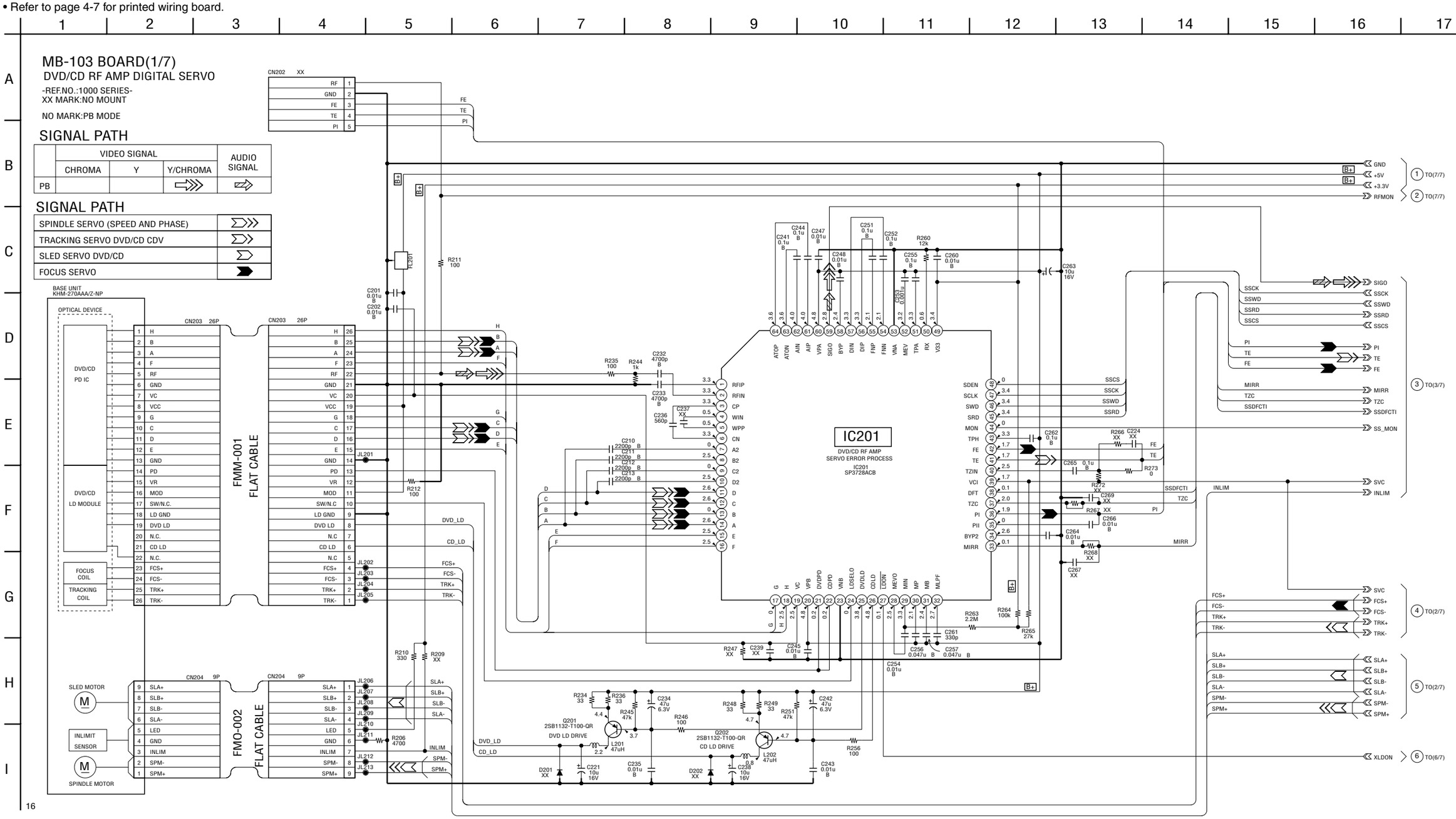
NO MARK:PB MODE

SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
PB			⇨	⇨

SIGNAL PATH

SPINDLE SERVO (SPEED AND PHASE)	⇨
TRACKING SERVO DVD/CD CDV	⇨
SLED SERVO DVD/CD	⇨
FOCUS SERVO	➡



DVD/CD RF AMP. DIGITAL SERVO

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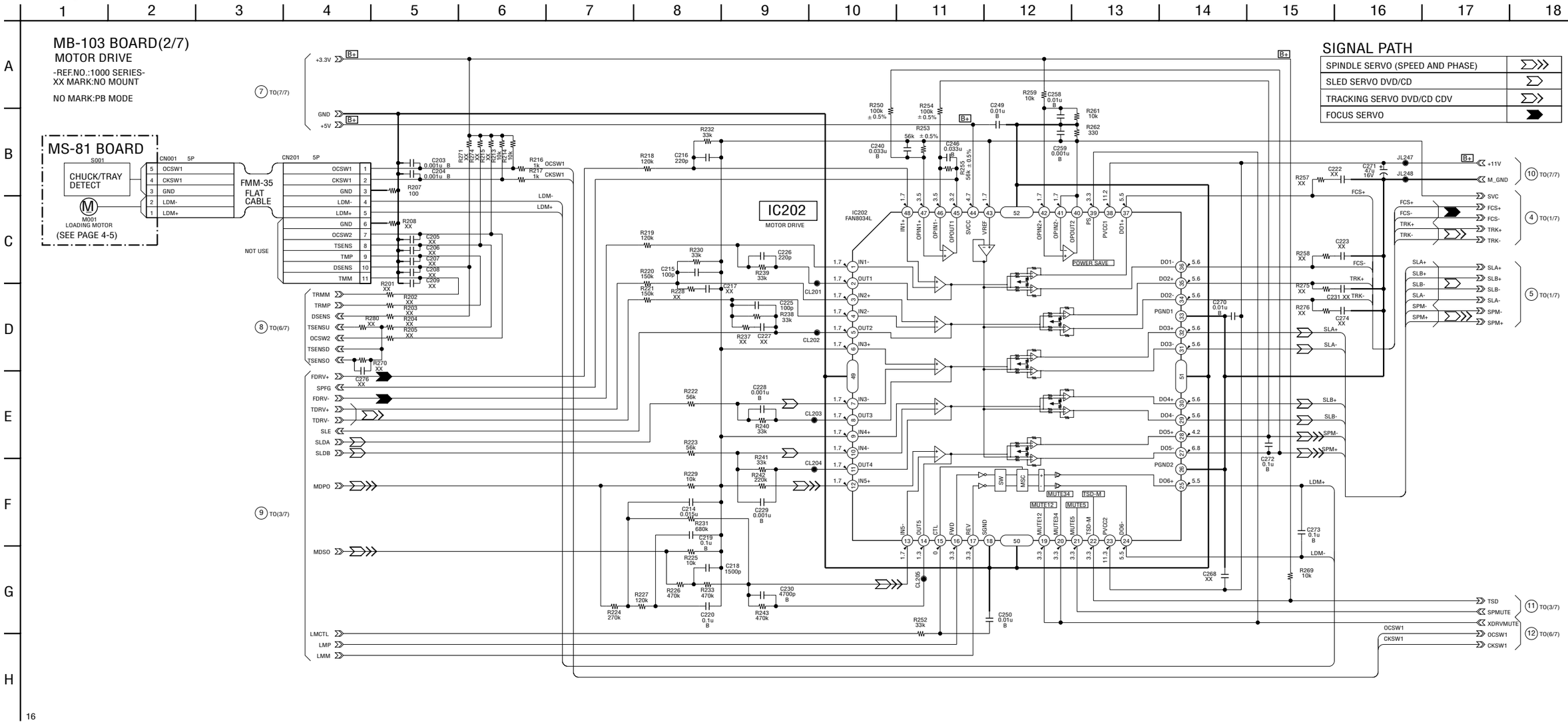
For Schematic Diagram

- Refer to page 4-7 for printed wiring board of MB-103 board.
- Refer to page 4-5 for printed wiring board of MS-81 board.



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For Schematic Diagram

• Refer to page 4-7 for printed wiring board.

MB-103 BOARD(3/7)

SERVO

-REF.NO.:1000 SERIES-

XX MARK:NO MOUNT

NO MARK:PB MODE

IC302

3.3V REG

IC303

16M D RAM

IC301

SERVO

IC301
CXD9703R

SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
PB			⇨	⇦

SIGNAL PATH

SPINDLE SERVO (SPEED AND PHASE)	⇨
TRACKING SERVO DVD/CD CDV	⇨
SLED SERVO DVD/CD	⇨
FOCUS SERVO	⇨

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For Schematic Diagram

• Refer to page 4-7 for printed wiring board.

MB-103 BOARD(4/7)

AV DECODER

-REF.NO.:1000 SERIES-
XX MARK:NO MOUNT

NO MARK:PB MODE

SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
PB	⇨	⇨	⇨	⇨

IC403
AD DECODER
IC403
CXD1935Q

IC401
+1.8V REG
IC401
TK11118CS

IC402
+3.3V REG
IC402
MM1386ENLE

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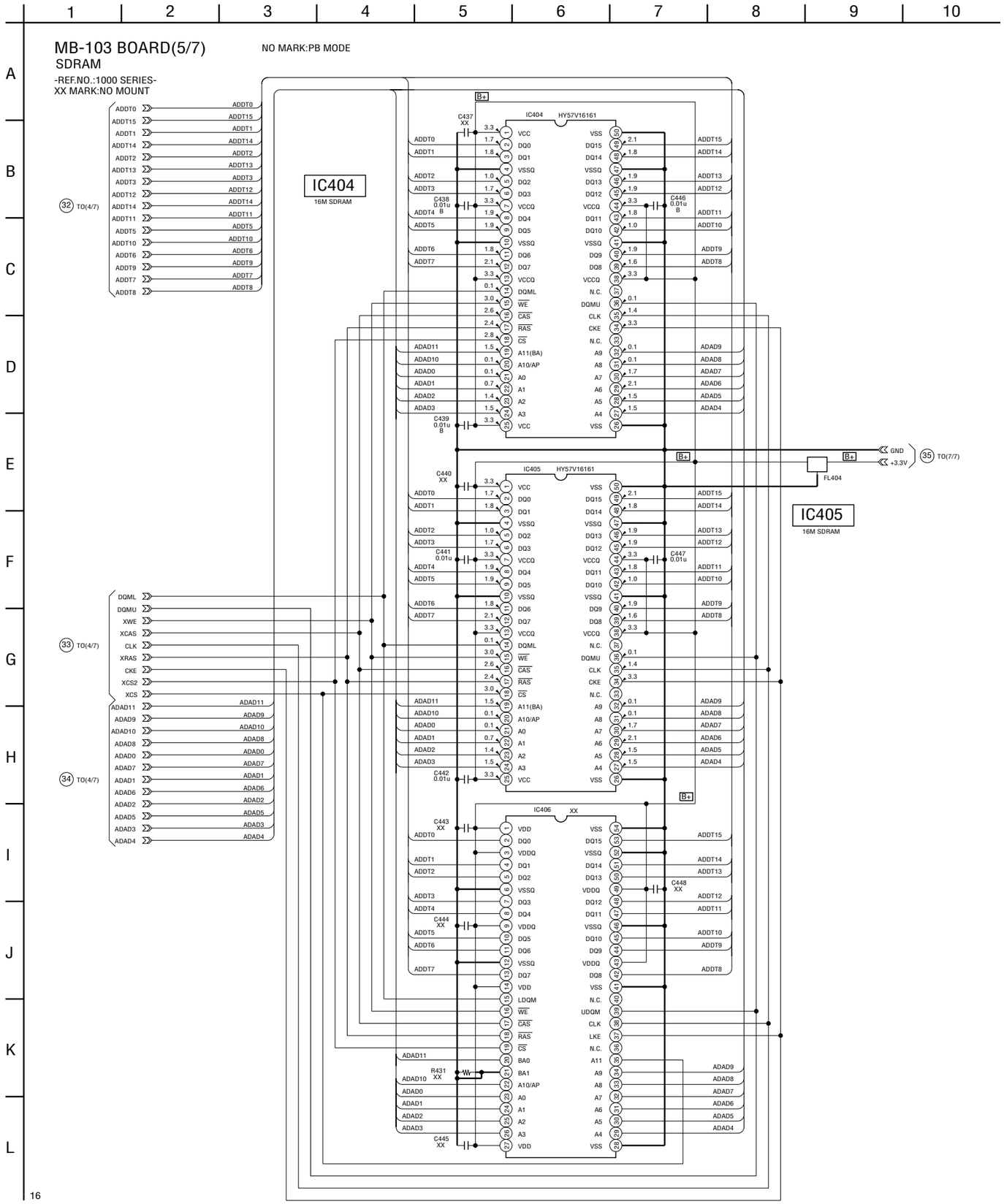
For Schematic Diagram

• Refer to page 4-7 for printed wiring board.



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For Schematic Diagram

- Refer to page 4-7 for printed wiring board.
- Refer to page 4-4 for waveform.

MB-103 BOARD(6/7)
SYSTEM CONTROL
-REF.NO.:1000 SERIES-
XX MARK:NO MOUNT
NO MARK:REC/PB MODE

IC101
EEP ROM
IC101 BR24C64F-E2

IC104
SYSTEM CONTROL
IC104 MB91307RPFV-G-BND-E1

IC106
FLASH MEMORY
IC106 MBM29DL324BE-90FTN

IC107 XX

IC108 XX

X101 16.5MHz

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For Schematic Diagram
- Refer to page 4-7 for printed wiring board.
- Refer to page 4-4 for waveforms.

MB-103 BOARD(7/7)

AUDIO DAC,PLL

-REF.NO.:1000 SERIES-
XX MARK:NO MOUNT

NO MARK:PB MODE

SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
PB	⇨	⇨	⇨	⇨

NOT USE: PR_V, PR_C, PR_Y, PR_Y/G, PR_CB/R, PR_CR/B

R613 XX, R614 XX

R612 0, FB602 0uH, FB603 0uH, R609 0, R608 0, R607 0

COMPOUT, COUT, YOUT, Y/G, CB/R, CR/B

27 TO(4/7)

MA_MUTE, RGBSEL, EUROVY, IPSW, EXT/DSEL, WIDE

R621 XX, R619 XX

38 TO(6/7)

CN601 25P B TO B

JL601	1	Cr/B
JL602	2	WIDE
JL603	3	Cb/R
JL604	4	D_GND
	5	Y/G
	6	D_GND
JL605	7	Y
	8	D_GND
JL606	9	C
JL607	10	DSEL
JL608	11	V
JL609	12	ISPW
JL522	13	D_GND
JL610	14	RGBSEL
JL611	15	ALT-
JL612	16	SPDIF
JL613	17	ALT+
JL614	18	P_GND_SPDIF
JL615	19	P_GND_AUDIO
JL616	20	RMUTE
JL617	21	ART+
JL618	22	LMUTE
JL619	23	ART-
JL620	24	MAMUTE
JL621	25	AU+5V

R623 XX

TO AV-63 BOARD(1/2) CN203

(SEE PAGE 4-27)

IC601
AUDIO D/A CONVERTER

IC601 CXD9627N-E

SPDIF1

25 TO(4/7)

BCK, ACH12, LRCK, XRST, XDACS, SC1, SO1, FSEL

15 TO(3/7,4/7, 6/7)

37 TO(6/7)

R601 100

1.6	1	MCLK	DZFL 16 4.9
1.7	2	BICK	DZFR 15 5.0
0	3	SDTI	VDD 14 5.0
1.7	4	LRCK	VSS 13
3.4	5	PDN	AOUTL+ 12 2.5
3.4	6	CSN	AOUTL- 11 2.5
3.4	7	CCLK	AOUTR+ 10 2.5
3.4	8	CDTI	AOUTR- 9 2.5

C602 0.22u B, C603 10u 16V, C604 0.01u B, C601 XX

36 TO(6/7): +1.8V, +3.3V, GND

35 TO(5/7): +3.3V, GND

26 TO(4/7): +5V, +1.8V, +3.3V, GND

13 TO(3/7): +1.8V, +5V, +3.3V, GND

7 TO(2/7): +5V, +3.3V, GND

1 TO(1/7): +5V, +3.3V, GND

2 TO(1/7) RFMON

39 TO(6/7): SO2, SI2, SI0, SC0, SO0, XFRRST, XIFCS, XIFBUSY

14 TO(3/7) 33MARP

24 TO(4/7) 512FSAVD

29 TO(4/7) 33MAVD, 27MAVD

IC103
PLL

IC103 SM8707EV-E2

	1	3.2 VDD	N.C. 1.6 16
	2	VSS 1.7	33-1OUT 3.3 15 JL103
JL101 JL102	3	27-1OUT	FSEL 1.6 14
	4	27-2OUT 3.2	33-2OUT 3.2 13 JL104
	5	VDD	VDD 12
	6	VSS 1.4	VSS 1.6 11
	7	XTI 1.4	512-1OUT 1.6 10 JL105
	8	XTO	512-2OUT 9 JL106

IC102 XX: CONT, GND, NOISE, VIN, VOUT

FL101, R108 2.2, C103 100u 4V, C104 0.01u B, C101 XX, C105 0.01u B, C106 9P, C107 9P, X102 27MHz, R114 0, R116 22, R176 0, R157 0, R158 XX, R159 0, R160 0, C112 XX, C110 0.01u B, R134 22, R135 XX, R136 22, R137 22, C113 XX, C116 XX, C117 XX, C119 XX

R134 22, R135 XX, R136 22, R137 22

FB103 0uH, L101 10uH, FL104, FB104 0uH, FB105 0uH, FL105, FB106 0uH, FB107 0uH, FL109, FB108 0uH, FB109 0uH, FL110, FB111 0uH

10 TO(2/7) +11V, M_GND

C125 47u 4V, C126 100u 6.3V, C127 47u 16V, C128 220u 4V, C124 XX

SO2, SI2, R185 1k

CN103 6P

JL123	6	TXD
JL124	5	RXD
JL125	4	GND
JL129	3	+3.3V
JL126	2	GND
	1	RF MON

FOR CHECK

CN101 9P B TO B

JL110	9	GND
JL111	8	XFRRST
JL130	7	3.3V_MNT
JL120	6	XIFCS
JL112	5	XIFBUSY
JL113	4	SIO
JL114	3	SCO
JL131	2	GND
JL115	1	SOO

R179 XX, R180 100, R186 XX, R181 0, R182 100, R183 100

TO IF-92 BOARD CN404

(SEE PAGE 4-34)

CN102 6P

JL116	1	+1.8V
JL117	2	+5V
JL121	3	GND
JL118	4	+3.3V
JL119	5	+11V
JL122	6	M_GND

TO IF-92 BOARD (CN403) (MF-129 HARNESS)

(SEE PAGE 4-33)

B+

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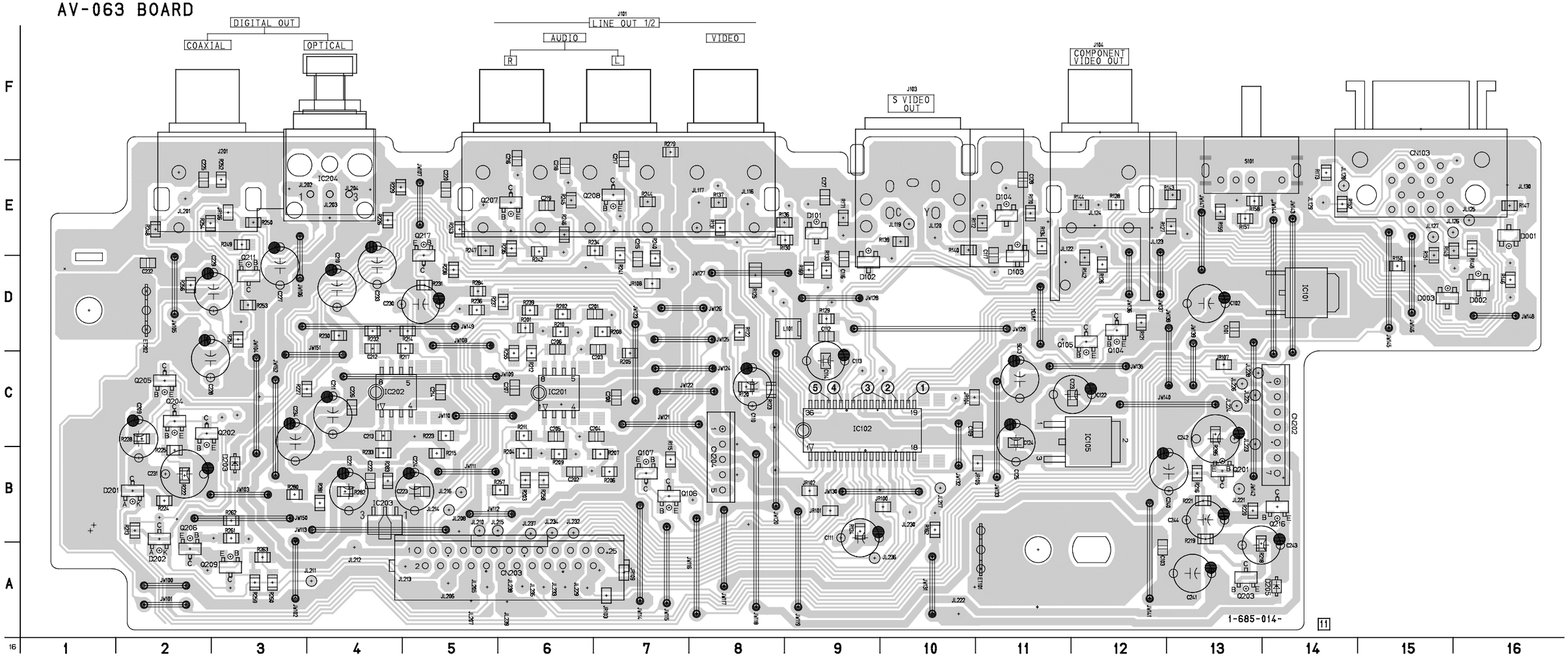
AV-063 (AUDIO OUT, VIDEO OUT) PRINTED WIRING BOARD

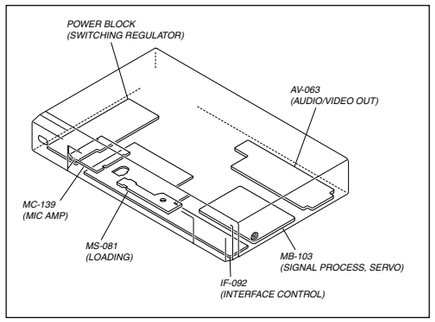
• : Uses unleaded solder.

AV-063 BOARD



For printed wiring board

There are a few cases that the part printed on this diagram isn't mounted in this model.



AV-063 BOARD

CN103	F-15	Q104	D-12
CN202	C-14	Q105	D-12
CN203	A-6	Q106	B-7
CN204	B-8	Q107	B-7
		Q201	B-13
D001	E-16	Q202	C-2
D002	D-16	Q203	A-13
D003	D-15	Q204	C-2
D101	E-9	Q205	C-2
D102	D-9	Q206	A-2
D103	D-11	Q207	E-6
D104	E-11	Q208	E-7
D201	B-2	Q209	A-3
D202	B-2	Q211	D-3
D203	B-3	Q216	B-14
D205	A-14	Q217	E-5
IC101	D-14	S101	E-13
IC102	C-9		
IC105	C-12		
IC201	C-6		
IC202	C-4		
IC203	B-4		
IC204	E-4		

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For Schematic Diagram

• Refer to page 4-25 for printed wiring board.

AV-63 BOARD(1/2)

AUDIO OUT

-REF.NO.:2000 SERIES-

XX MARK:NO MOUNT

IC201 BA4558F-E2 AUDIO AMP

IC202 BA4558F-E2 AUDIO AMP

IC203 NJM78L05UA-TE1 +5V REG

IC204 TOTX178 OPTICAL DIGITAL OUT

Q205 2SB709A-QRS-TX MUTE DRIVE

Q204 DTC124TKA-T146 MUTE DRIVE

Q202 UN2213-TX MUTE DRIVE

Q206 2SB710A-RTX MUTE DRIVE

Q209 2SC2712-YG-TE85L MUTE DRIVE

Q207 2SD1938(F)-ST(TX).SO RCH MUTE

Q208 2SD1938(F)-ST(TX).SO LCH MUTE

Q217 2SD1938(F)-ST(TX).SO MUTE DRIVE

Q211 2SC2712-YG-TE85L BUFFER

Q201 2SB710A-RTX SWITCH

Q203 2SC2712-YG-TE85L SWITCH

Q216 2SB709A-QRS-TX SWITCH

D201 DAN202K-T-146

D202 DAP202K-T-146

D203 1SS355TE-17

D205 1SS355TE-17

CN203 25P

CR/B	25	JL217
WIDE	24	JL229
CB/R	23	JL230
D_GND	22	JL236
Y/G	21	
D_GND	20	JL232
Y	19	JL233
D_GND	18	JL234
C	17	JL235
DSEL	16	JL237
V	15	JL238
IPSW	14	
D_GND	13	JL239
RGBSEL	12	JL215
ALT-	11	JL205
SPDIF	10	JL210
ALT+	9	JL207
P_GND_SPDIF	8	JL208
P_GND_AUDIO	7	JL206
RMUTE	6	JL214
ART+	5	JL211
LMUTE	4	JL216
ART-	3	JL213
MAMUTE	2	JL212
AU+5V	1	B+

TO MB-103 BOARD(7/7) CN601 (SEE PAGE 4-24)

CN204 5P

1	GND	B-
2	-11V	
3	+11V	B+
4	MIC	
5	MIC+ECHO	

TO MC-139 BOARD CN501 (AM-130 HARNESS) (SEE PAGE 4-37)

CN202 7P

JL221	7	SW-13V
JL222	6	AI+5V
JL223	5	AU+11V
JL224	4	GND
JL225	3	EVER+3.3V
JL226	2	A_MUTE
JL228	1	VMUTE

TO IF-92 BOARD CN402 (AF-122 HARNESS) (SEE PAGE 4-33)

SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC				
PB	⇨	⇉	⇶	⇨

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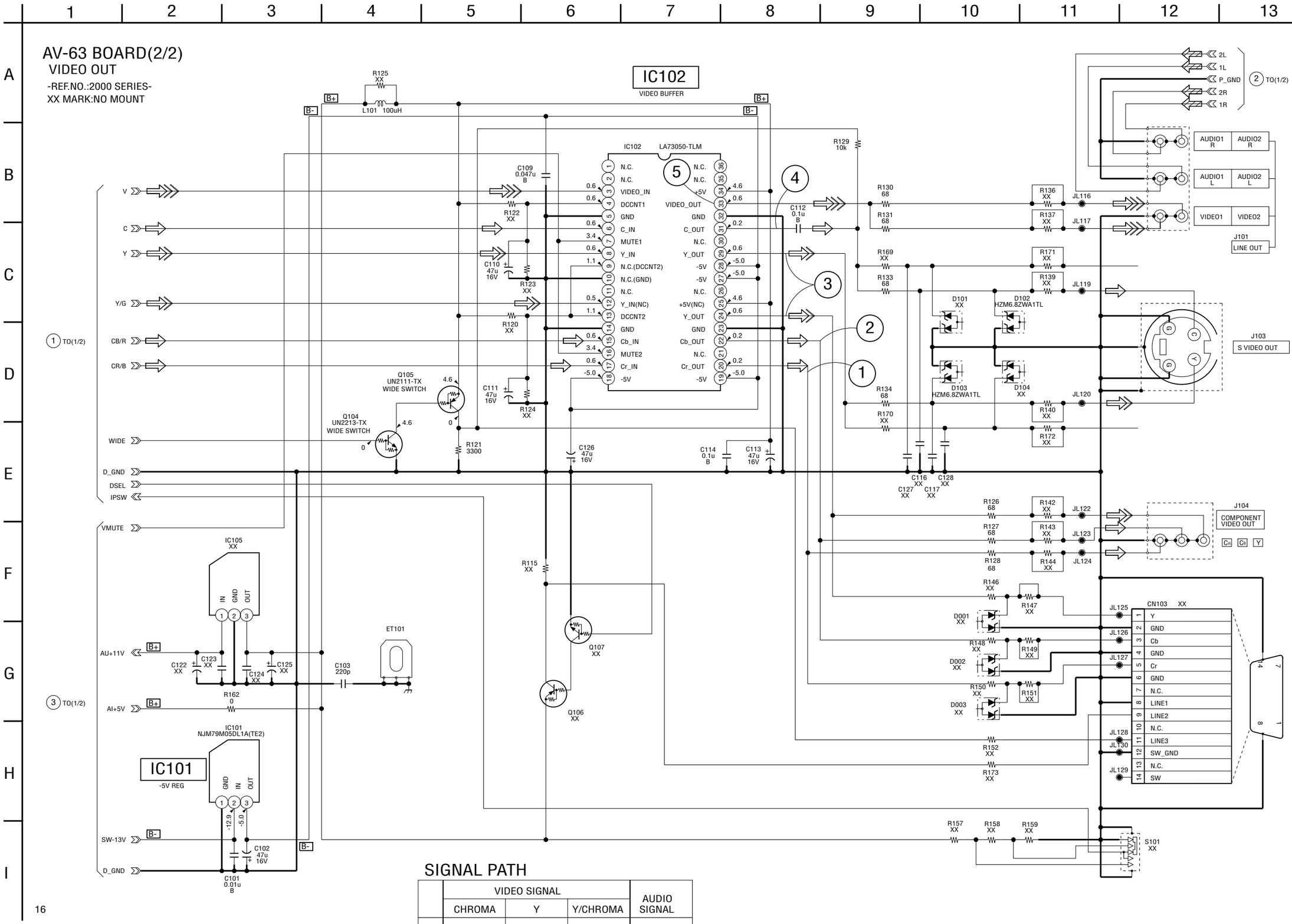
For Schematic Diagram
- Refer to page 4-25 for printed wiring board.
- Refer to page 4-4 for waveforms.



SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC				
PB	⇨	⇨	⇨	⇨

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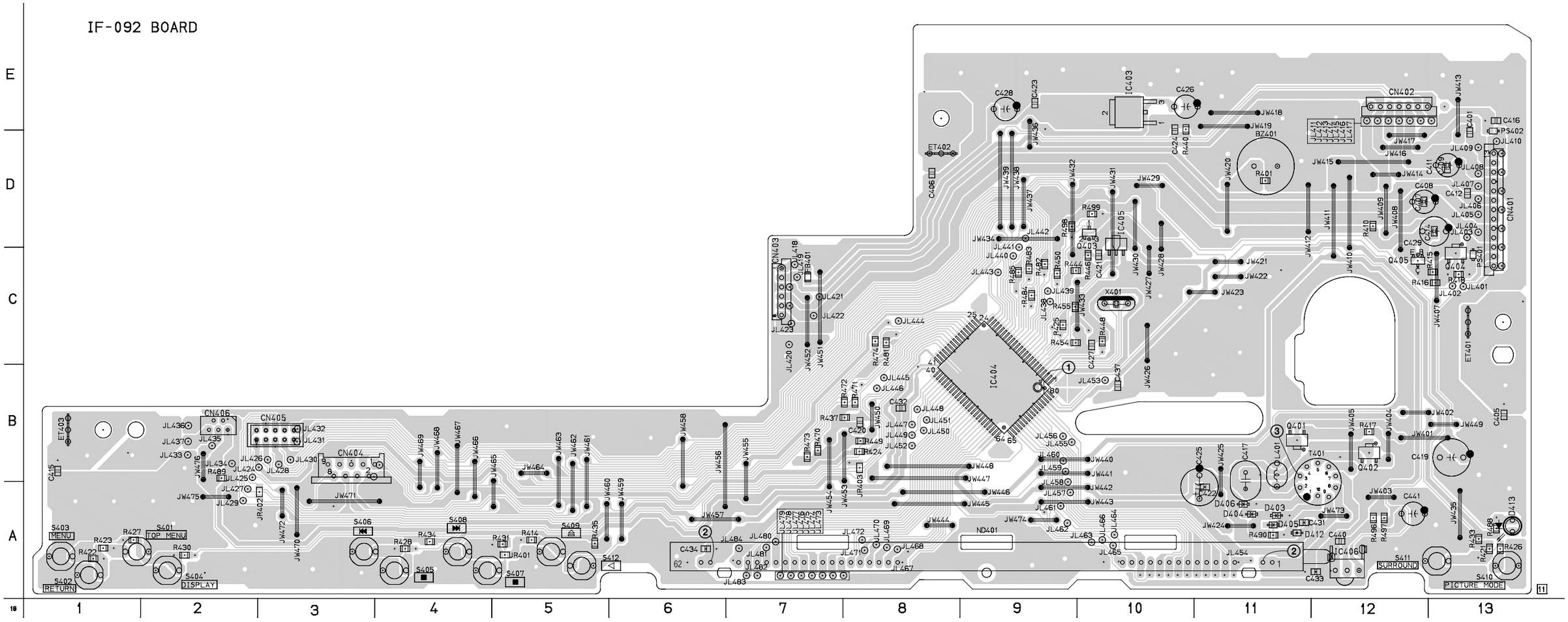
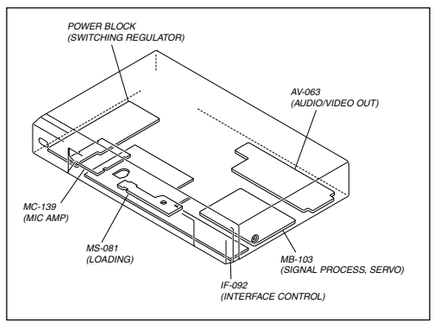
IF-092 (IF COM) PRINTED WIRING BOARD

• : Uses unleaded solder.



For printed wiring board

There are a few cases that the part printed on this diagram isn't mounted in this model.



IF-092 BOARD

CN401	D-13	Q403	D-10
CN402	E-12	Q404	C-13
CN403	C-7	Q405	C-12
CN404	B-3		
CN405	B-3	S401	A-1
CN406	B-2	S402	A-1
		S403	A-1
D403	A-11	S404	A-2
D404	A-11	S405	A-4
D405	A-11	S406	A-3
D406	A-11	S407	A-5
D412	A-11	S408	A-4
D413	A-13	S409	A-5
		S410	A-13
IC403	E-10	S411	A-13
IC404	B-9	S412	A-5
IC405	D-10		
IC406	A-12		
Q401	B-11		
Q402	B-12		

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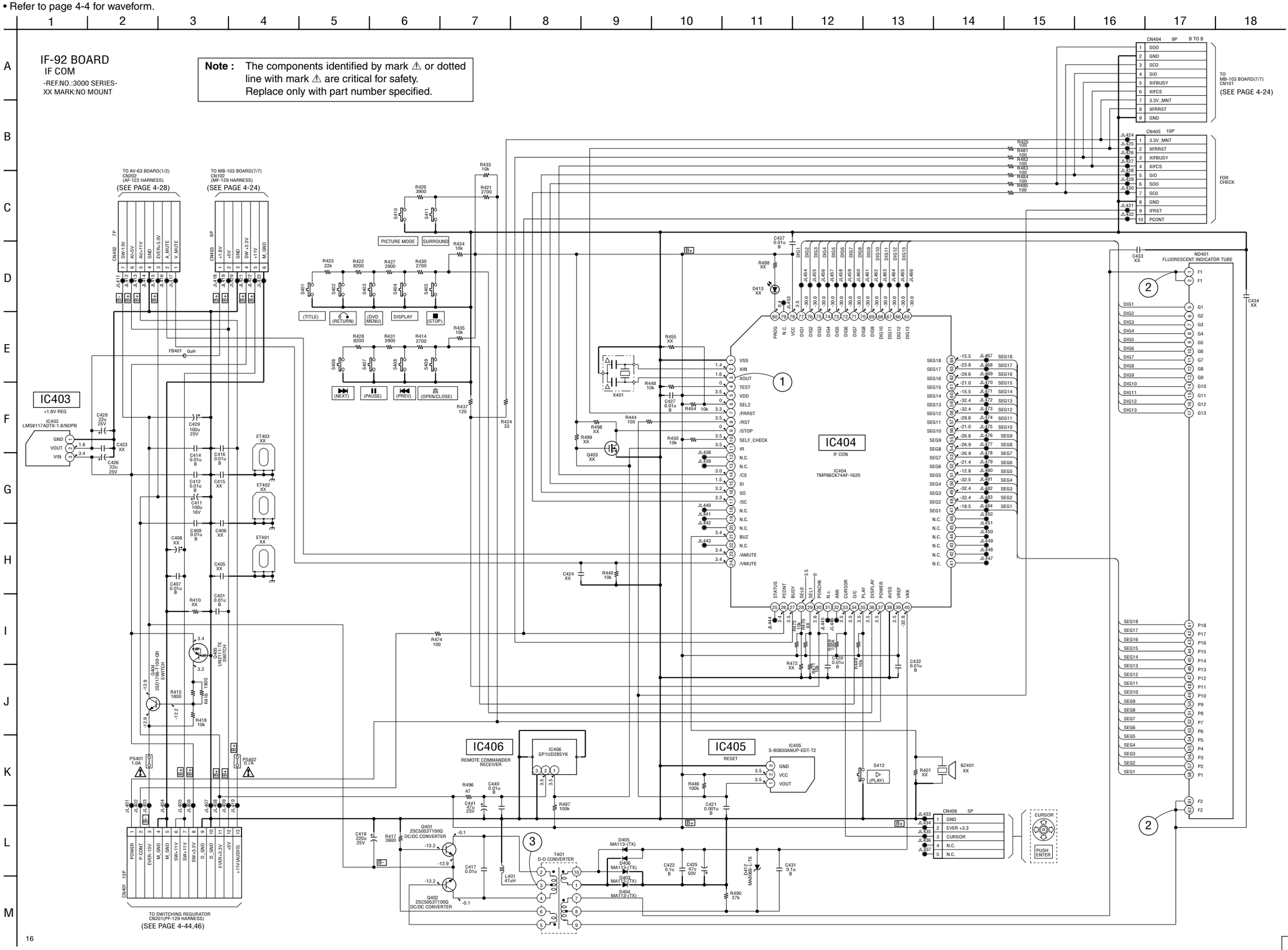
For Schematic Diagram

• Refer to page 4-4 for waveform.



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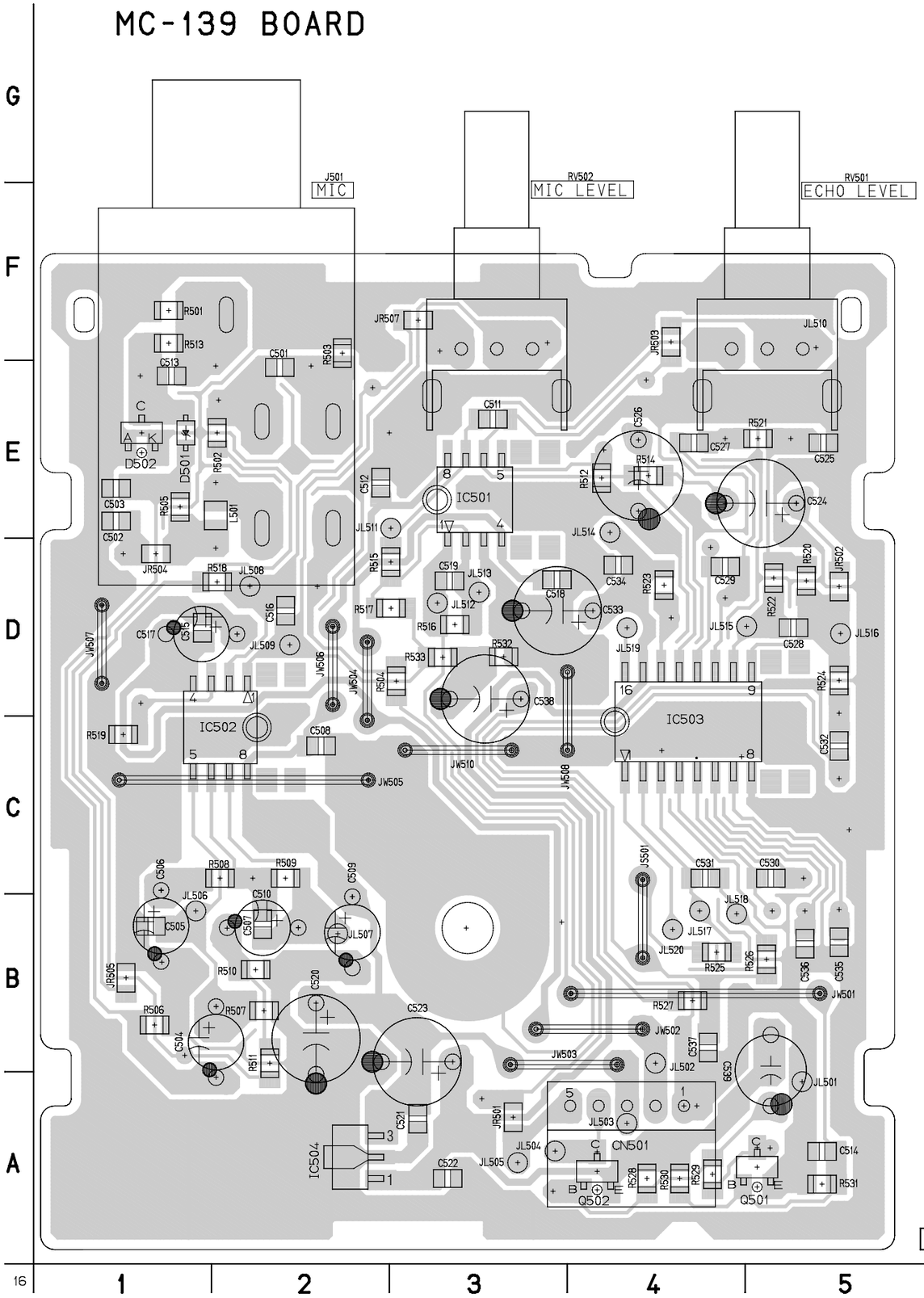
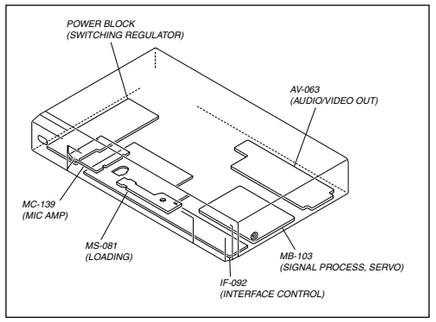
MC-139 (MIC AMP) PRINTED WIRING BOARD

• : Uses unleaded solder.



For printed wiring board

There are a few cases that the part printed on this diagram isn't mounted in this model.



MC-139 BOARD

CN501	A-4
D501	E-1
D502	E-1
IC501	E-3
IC502	C-2
IC503	C-4
IC504	A-2
Q501	A-5
Q502	A-4
RV501	F-5
RV502	F-3

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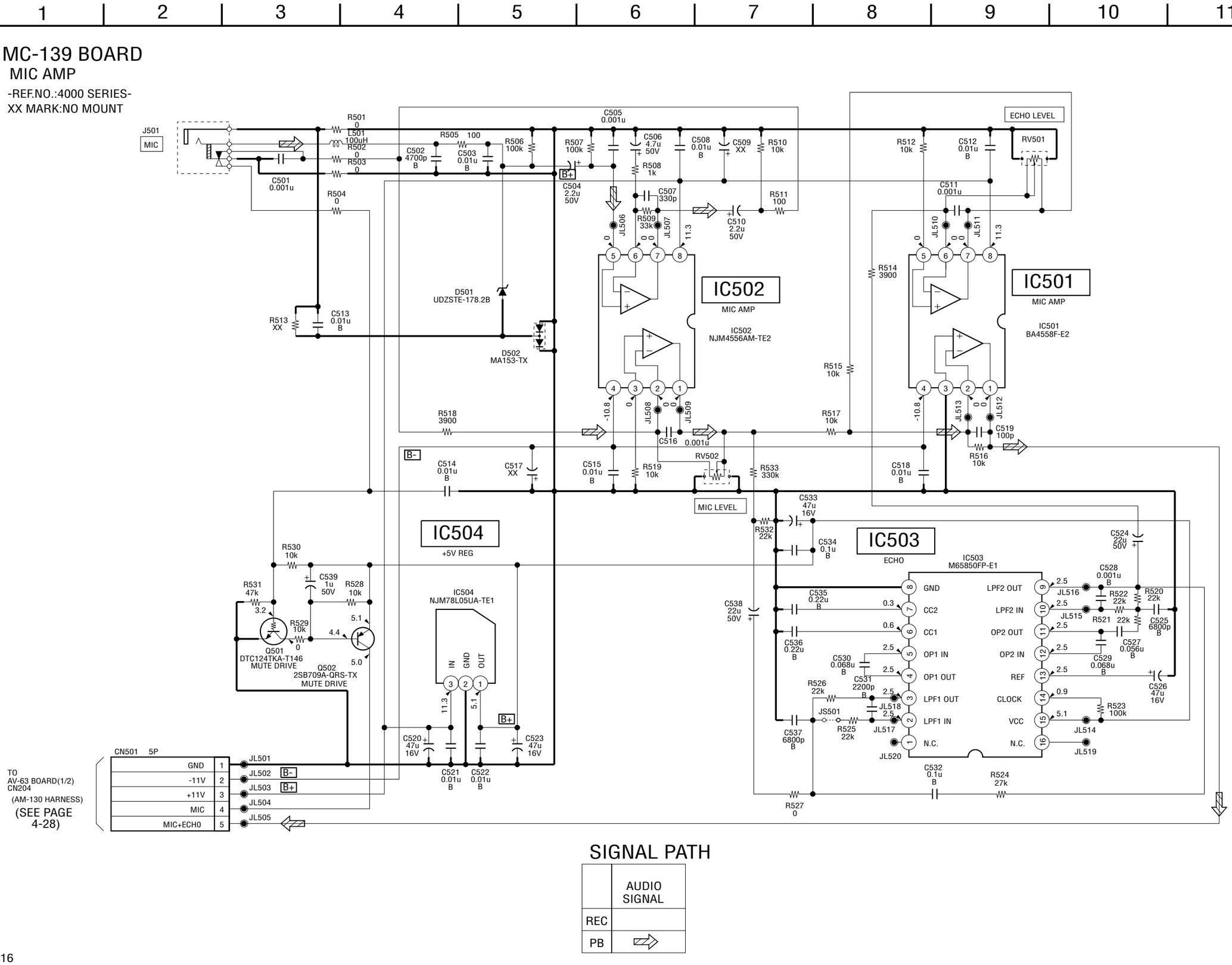
MC-139 BOARD

MIC AMP

-REF.NO.:4000 SERIES-

XX MARK:NO MOUNT



SIGNAL PATH

	AUDIO SIGNAL
REC	
PB	⇨

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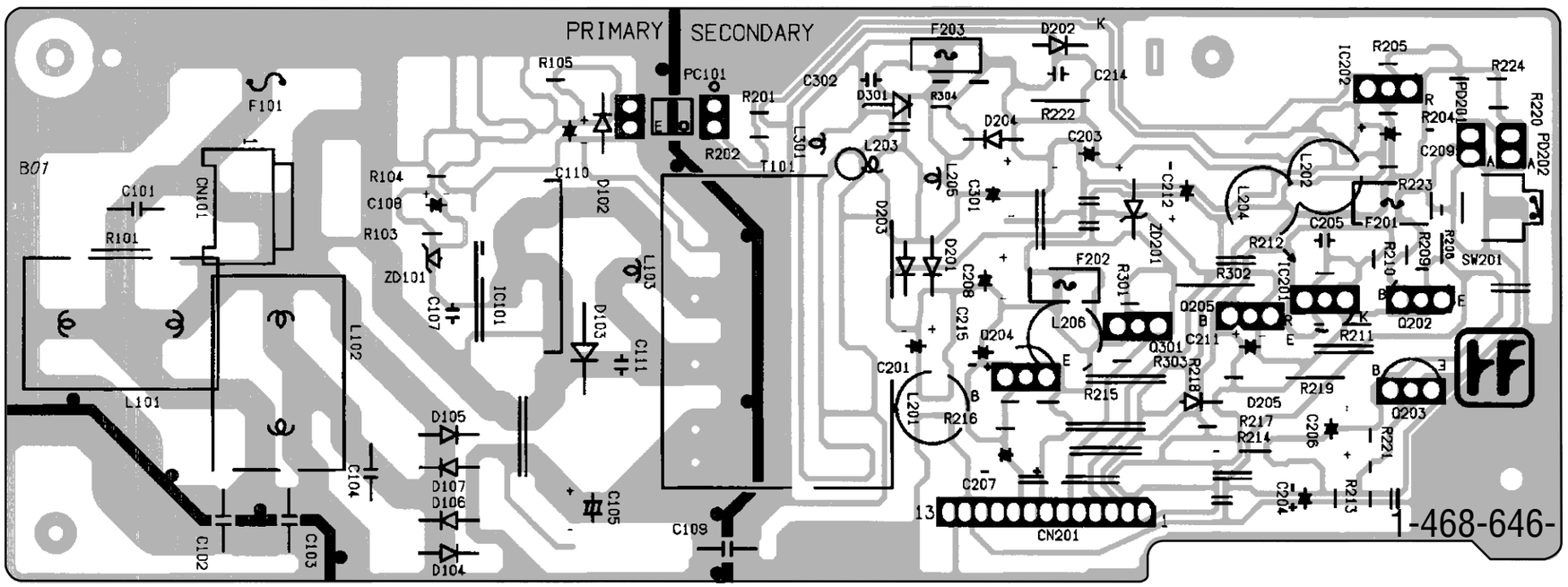
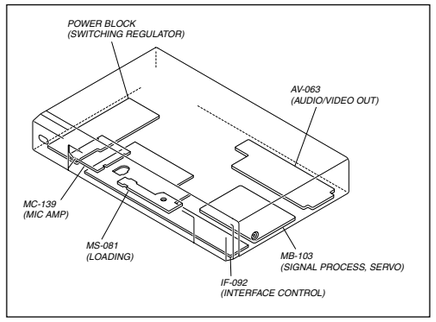
ETXNY381N2F (SWITCHING REGULATOR) PRINTED WIRING BOARD

• : Uses unleaded solder.

POWER BOARD (SW REG)
(ETXNY381N2F) (E: HK,SP)



1-468-646-11



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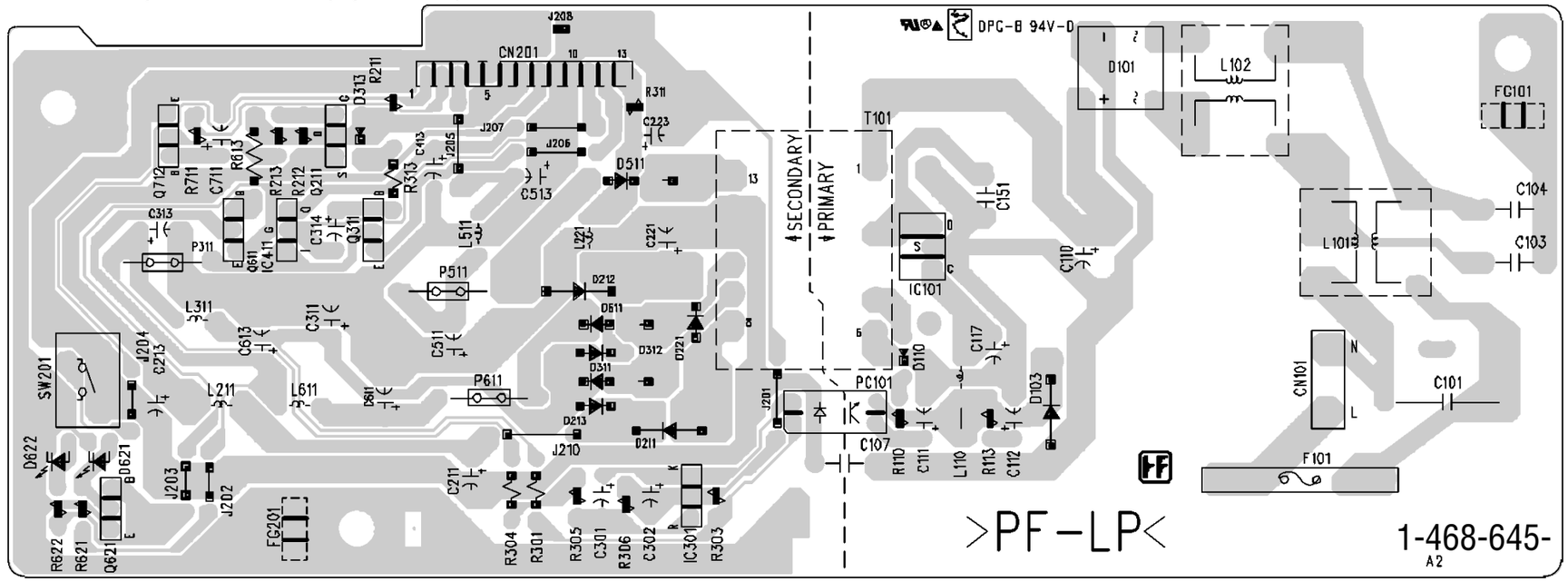
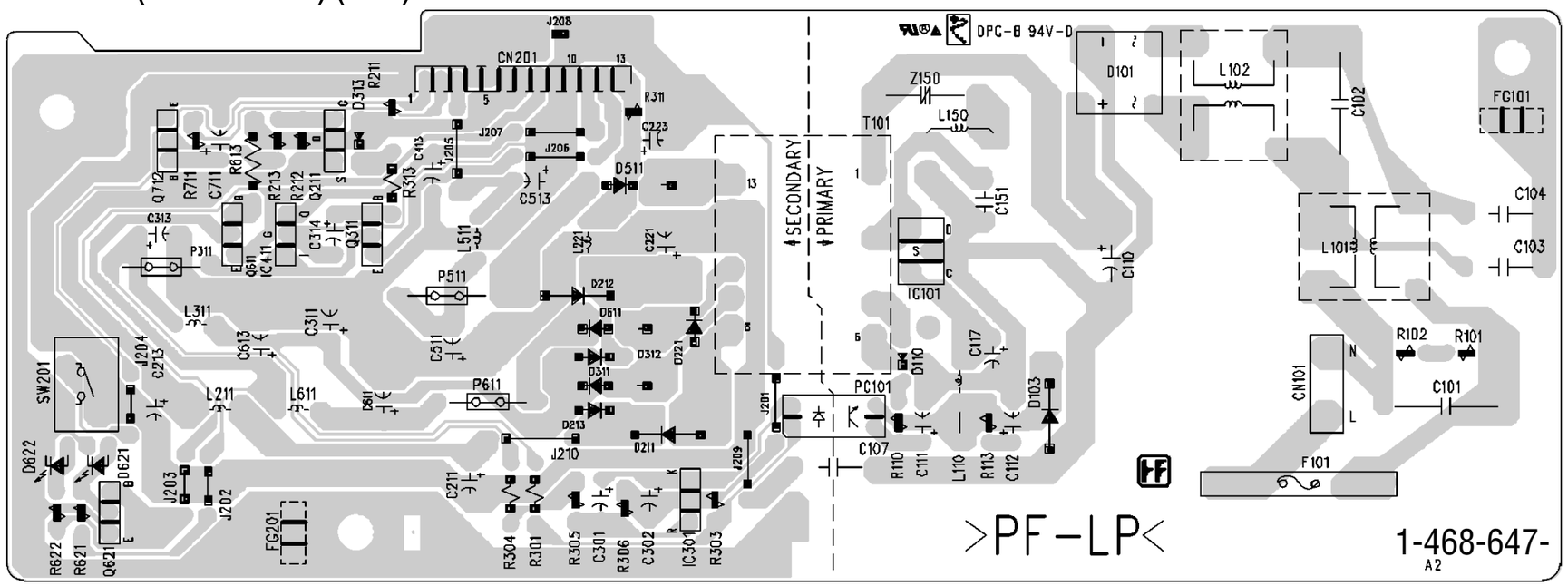
HS11S1U/HS11S1F (SWITCHING REGULATOR) PRINTED WIRING BOARD

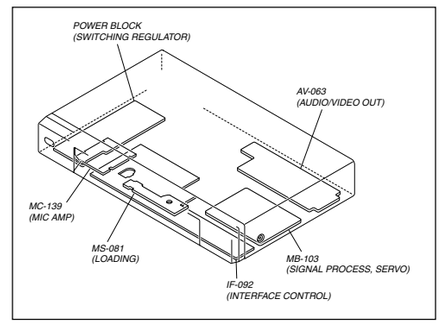
• : Uses unleaded solder.

POWER BOARD (SW REG)
(HS11S1U)(E:TW)



POWER BOARD (SW REG)
(HS11S1F)(BR)





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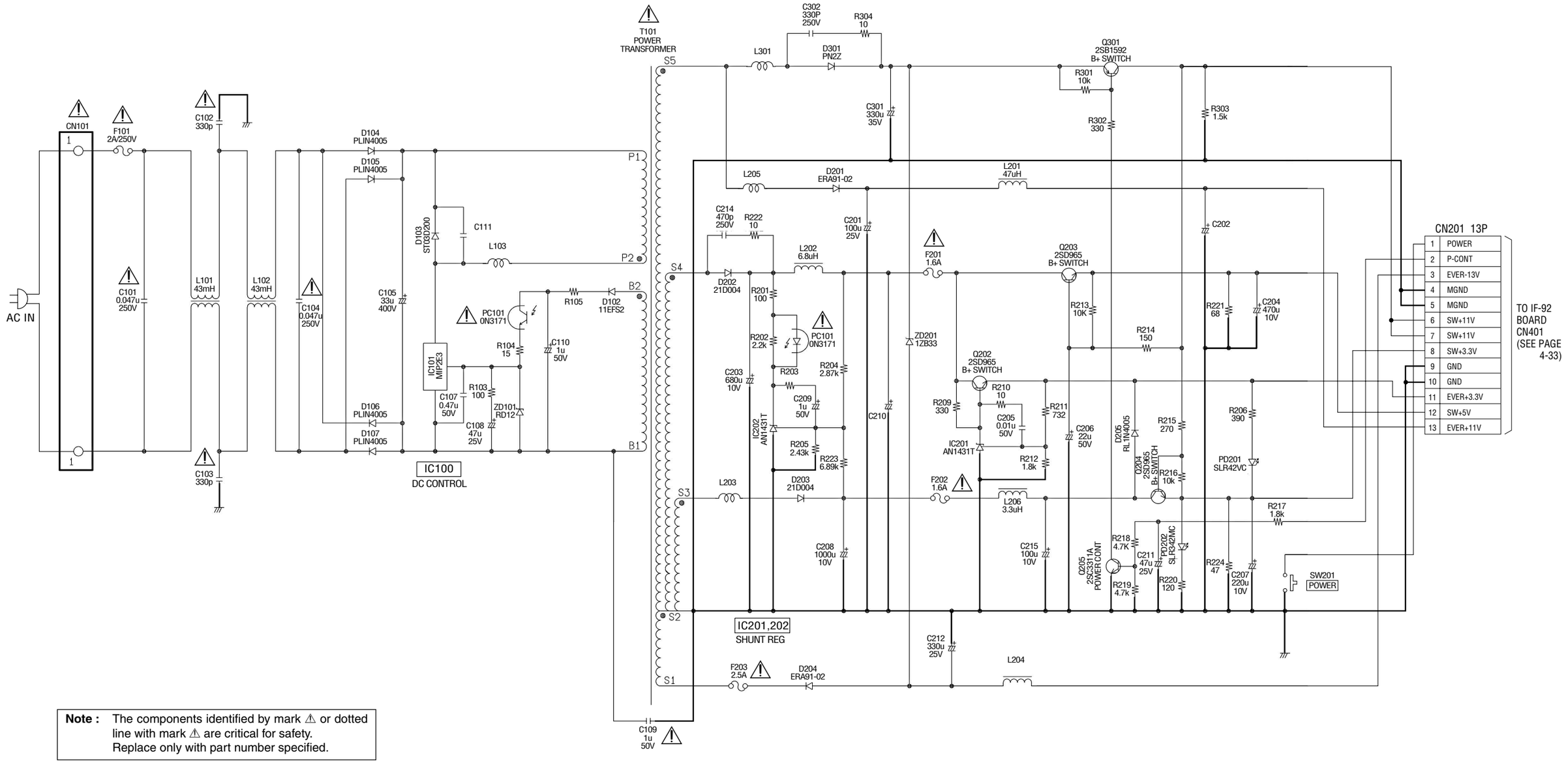
For Schematic Diagram

• Refer to page 4-39 for printed wiring board.

⚠ SWITCHING REGULATOR (ETXNY381N2F) (E: HK,SP)



Note : The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

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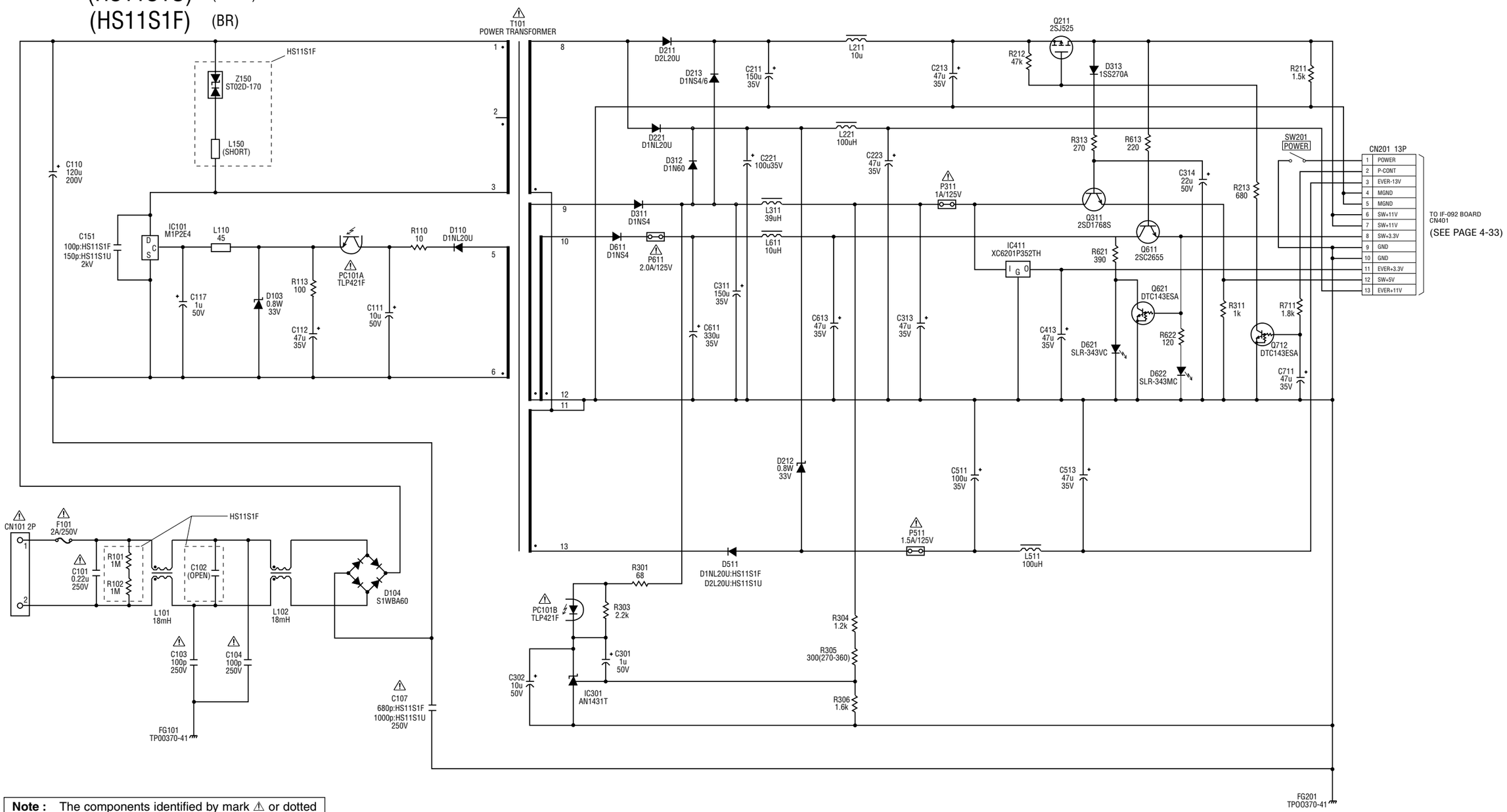
For Schematic Diagram

• Refer to page 4-41 for printed wiring board.

SWITCHING REGULATOR
(HS11S1U) (E: TW)
(HS11S1F) (BR)



Note : The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

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SECTION 5
IC PIN FUNCTION DESCRIPTION

5-1. SYSTEM CONTROL PIN FUNCTION (MB-103 BOARD IC104: MB91307RPFV-G-BND-E1)

Pin No.	Pin Name	I/O	Function
1-5	HA17-HA21	O	Address bus A17 to A21
6	HA22	–	Not used
7	WP	O	I2C EEPROM write protect output
8	XSACS	–	Not used
9	AVCC	–	Power supply (+3.3 V)
10	AVRH	–	Reference power supply (+3.3 V)
11	AVSS	–	GND
12	AN0	I	Set of mode 0
13	AN1	I	Set of mode 1
14	AN2	I	Set of mode 2
15	AN3	I	Set of mode 3 (fixed at “H”)
16	INT0	I	AV DEC Interrupt input
17	INT1	I	ARP Interrupt input
18	INT2	I	SDSP Interrupt input
19	INT3	–	Not used
20	INT4	I	IF CON interrupt input
21	INT5	–	Not used
22	INT6	–	Not used
23	INT7	–	Not used
24	VCC	–	Power supply (+3.3 V)
25	SI0	I	Serial bus 0 (data input)
26	SO0	O	Serial bus 0 (data output)
27	SC0	O	Serial bus 0 (clock output)
28	SI1	–	Not used
29	SO1	O	Serial bus 1 (data output)
30	SC1	O	Serial bus 1 (clock output)
31	SI2	I	Serial bus 2 (data input)
32	SO2	O	Serial bus 2 (data output)
33	DSENS	–	Not used
34	VSS	–	GND
35	XRST	O	System reset signal output
36	XARPRST	O	WIDE select signal output
37	RGBSEL	–	Not used
38	SDA	I/O	I2C data input/output
39	SCL	O	I2C clock output
40	TRM +	–	Not used
41	EUROV/Y	–	Not used
42	EXT/DSEL	–	Not used
43	MD0	I	Input of mode select 0 (fixed at “H”)
44	MD1	I	Input of mode select 1 (fixed at “L”)
45	MD2	I	Input of mode select 2 (fixed at “L”)
46	DREQ0	I	AV DEC DMA-REQ 0 input
47	DACK0	O	AV DEC DMA-ACK 0 output
48	XDRVMUTE	O	Drive mute signal output
49	DREQ1	I	AV DEC DMA-REQ 1 input
50	DACK1	O	AV DEC DMA-ACK 1 output
51	XIFCS	O	IF CON chip select signal output
52	VSS	–	GND
53	X1	O	Clock output (16.5 MHz)
54	X0	I	Clock input (16.5 MHz)

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Pin No.	Pin Name	I/O	Function
55	VCC	–	Power supply (+3.3 V)
56	CKSW1	I	Chuck sensor input
57	OCSW1	I	Tray sensor input
58	CS0X	O	Chip select signal output (for external ROM)
59	CS1X	–	Not used
60	CS2X	O	AV DEC chip select signal output
61	CS3X	O	AV DEC chip select signal output
62	CS4X	O	ARP chip select signal output
63	CS5X	O	SDSP chip select signal output
64	VCCI	–	Power supply (+1.8 V)
65	CS6X	–	Not used
66	CX7X	–	Not used
67	XWAIT	I	Wait signal input
68	BGRNTX	I	Test terminal (fixed at “H”)
69	BRQ	I	Test terminal (fixed at “L”)
70	XRD	O	Read enable signal output
71	XWRH	O	High order byte write enable signal output
72	XWRL	–	Not used
73	NMIX	I	Not used (Fixed at “H”)
74	VCCI	–	Power supply (+1.8 V)
75	VSS	–	GND
76	XFRRST	I	IF CON reset signal input
77	CPUCK	O	CPU clock signal output
78	OCSW2	–	Not used
79	XDACS	O	DAC (2 CH) chip select signal output
80	TRM –	–	Not used
81	48/44.1K	O	PLL FS control signal output
82	WIDE	O	LD mute signal output
83	MAMUTE	O	Audio mute signal output
84	SRAMWE	–	Not used
85-92	HD0-HD7	I/O	Data bus D0 to D7 (16 bits only)
93-100	HD8-HD15	I/O	Data bus D8 to D15 (16 bits) and D0 - D7 (8 bits)
101	VSS	–	GND
102-109	HA0-HA7	O	Address bus A00 to A07
110	VCC	–	Power supply (+3.3 V)
111-118	HA8-HA15	O	Address bus A08 to A15
119	VSS	–	GND
120	HA16	O	Address bus A16

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SECTION 6
TEST MODE

6-1. GENERAL DESCRIPTION

The Test Mode allows you to make diagnosis and adjustment easily using the remote commander and monitor TV. The instructions, diagnostic results, etc. are given on the on-screen display (OSD).

6-2. STARTING TEST MODE

Press the [TOP MENU], [CLEAR], [POWER] keys on the remote commander in this order with the power of main unit in OFF status, and the Test Mode starts, then "DIAG START" will be displayed on the fluorescent display tube and the menu shown below will be displayed on the TV screen. At the bottom of menu screen, the model name and revision number are displayed. Last Off at the lower right of screen indicates the information code concerning the last power off. To execute each function, select the desired menu and press its number on the remote commander. To exit from the Test Mode, press the [POWER] key.

```
          Test Mode Menu

0. Syscon Diagnosis
1. Drive Auto Adjustment
2. Drive Manual Operation
3. Mecha Aging
4. Emargency History
5. Version Information
6. Video Level Adjustment
                  Exit: Power Key
_
Model     : DPX-16xxxx
Revision : x.xxx    Last Off: xx
```

Power Off Information Code List

00: Primary Power Off
01: Power Off Request from SYSTEM CONTROL
02: Power Off by Emergency Power Off Command from SYSTEM CONTROL
(if information is sent from SYSTEM CONTROL)
03: IF CON Judged that SYSTEM CONTROL is Faulty
04: Power Off from Diagnosis Mode of IF CON
05: Forced Power Off by the User
06: Power Off by Power Supply Voltage Monitor

6-3. SYSCON DIAGNOSIS

The same contents as board detail check by serial interface can be checked from the remote commander. On the Test Mode Menu screen, press [0] key on the remote commander, and the following check menu will be displayed.

```
    ### Syscon Diagnosis ###
                  Check Menu
0. Quit
1. All
2. Version
3. Peripheral
4. Servo
5. Supply
6. AV Decoder
7. Video
8. Audio
_
```

0. (Quit)

Quit the Syscon Diagnosis and return to the Test Mode Menu.

1. (All items continuous check)

This menu checks all diagnostic items continuously. Normally, all items are checked successively one after another automatically unless an error is found, but at a certain item that requires judgment through a visual check to the result, the following screen is displayed for the key entry.

```
    ### Syscon Diagnosis ###

         Diag All Check
          No. 2 Version

 2-3. ROM Check Sum
Check Sum = 2005



Press NEXT Key to Continue
Press PREV key to Repeat
_
```

For the ROM Check, the check sum calculated by the Syscon is output, and therefore you must compare it with the specified value for confirmation.
Following the message, press [▶▶|] key to go to the next item, or [|◀◀] key to repeat the same check again.

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To quit the diagnosis and return to the Check Menu screen, press ■ or ENTER key. If an error occurred, the diagnosis is suspended and the error code is displayed as shown below.

```
    ### Syscon Diagnosis ###


 3-2. EEPROM Check
Error 03: EEPROM  Write/Read N
Address       : 00000001
Write Data    : 2492
Read   Data   : 2490
Press NEXT Key to Continue
Press PREV key to Repeat
_
```

Press ■ key to quit the diagnosis, or ⏮ key to repeat the same item where an error occurred, or ⏭ key to continue the check from the item next to faulty item.

Selecting 2 and subsequent items call the submenu screen of each item. When "———" is displayed in the submenu, it means that the test is not supported in the model.

For example, if "5. Supply" is selected, the following submenu will be displayed.

```
    ### Syscon Diagnosis ###
           Check Menu
         No. 5 Supply
0. Quit
1. All
2. ARP Register Check
3. ARP to RAM Data Bus
4. ARP to RAM Address Bus
5. ARP RAM Check
_
```

0. (Quit)

Quit the submenu and return to the main menu.

1. (All submenu items continuous check.)

This menu checks 2 and subsequent items successively. At the item where visual check is required for judgment or an error occurred, the checking is suspended and the message is output for key entry. Normally, all items are checked successively one after another automatically unless an error is found.
Selecting 2 and subsequent items executes respective menus and outputs the results.
For the contents of each submenu, see "General Description of Checking Method" and "Check Items List".

General Description of Checking Method

2. Version

(2-2) Revision
ROM revision number is displayed.
Error: Not detected.
The revision number defined in the source file is displayed with four digits.

(2-3) ROM Check Sum
Check sum is calculated.
Error: Not detected.
8-bit data are added up to the ROM address 0x000F0000 to 0x002EFFFF, and the result is displayed with 4-digit hexadecimal number. Error is not detected. Compare the result with the specified value.

(2-4) Model Type
Model code is displayed.
Error: Not detected.
The model code read from the EEPROM is displayed with 2-digit hexadecimal number.

(2-5) Region
Region code is displayed.
Error: Not detected.
The region code determined from the model code is displayed.

(2-6) M't Check
Mount resistance is checked.
Error 22: The region code does not accord.
Check whether the region code that is deduced from model resistance and destination resistance accords with the region code that is deduced from region resistance value.

3. Peripheral

(3-2) EEPROM Check
Data write ⟶ read, and accord check
Error 03: EEPROM write/read discord
0x9249, 0x2942 and 0x4294 are written to the address 0x00 to 0xFF of the EEPROM and then read for checking. Before writing, the data are saved, then after checking, they are written to restore the contents of EEPROM.

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4. Servo

(4-2) Servo DSP Check
Data write ⟶ read, and accord check
Error 12: Read data discord
0x9249, 0x2942 and 0x4294 are written to the RAM address 0x602 of the Servo DSP and then read for checking.

(4-3) ——————
Check no support.

(4-4) RF Amp Register Check
Data write ⟶ read, and accord check
Error 13: RF Amp register write, and read data discord
Implement 8-bit shift operation of the 0x01 to the readable/writable register of the RF Amp. If once write data do not accord with read data, it is NG.

5. Data Supply System

(5-2) ARP Register Check
Data write ⟶ read, and accord check
Error 08: ARP register write, and read data discord
Data 0x00 to 0xFF is written sequentially to the ARP TMAX register (address 0xC6) and then read for checking.

(5-3) ARP to RAM Data Bus
Data write ⟶ read, and accord check
Error 09: ARP ⟷ RAM data bus error
Data 0x0001 to 0x8000 where one bit each is set to 1 are written to the address 0 of RAM (IC303) connected to the ARP (IC302) through the bus, then they are read and checked. In case of discord, written bit pattern and read data are displayed. If data where multiple bits are 1 are read, the bits concerned may touch each other. Further, if data where certain bit is always 1 or 0 regardless of written data, the line could be disconnected or shorted.

(5-4) ARP to RAM Address Bus
Data write ⟶ other address read discord check
Error 10: ARP ⟷ RAM address bus error
Caution: Address and data display in case of an error is different from the display of other diagnosis (described later).
Before starting the test, all addresses of RAM (IC303) are cleared to 0x0000.
First, 0xA55A is written to the address 0x00000, and the address data are read and checked from addresses 0x00001 to 0x80000 while shifting 1 bit each. Next, the data at that address is cleared, and it is written to the address 0x00001, and read and checked in the same manner. This check is repeated up to the address 0x80000 while shifting the address data by 1 bit each.
If data other than 0 is read at the addresses except written address, an error is given because all addresses were already cleared to 0. In this check, the error display pattern is different from that of other diagnosis; read data, written address, and read address are displayed in this order. However, the message uses same template, and accordingly exchange Address and Data when reading. The following display, for example,

```
    ### Syscon Diagnosis ###



 5-4. ARP to RAM Address Bus
Error 10: ARP - RAM Address B
Address       : 0000A55A
Write Data    : 00000000
Read Data     : 00080000
Press NEXT Key to Continue
Press PREV key to Repeat
_
```

shows the data 0xA55A was read from address 0x00080000 though it was written to the address 0x00000000. This implies that these addresses are in the form of shadow. Also, if the read data is not 0xA55A, another error will be present.

(5-5) ARP RAM Check
Data write ⟶ read, and accord check
Error 11: ARP RAM read data discord
The program code data stored in ROM are copied to all areas of RAM (IC303) connected to the ARP through the bus, then they are read and checked if they accord. If the detail check was selected initially, the data are written to all areas and read, then the same test is conducted once again with the data where all bits are inverted between 1 and 0. If discord is detected, faulty address, written data, and read data are displayed following the error code 11, and the test is suspended.

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6. AV Decoder

(6-2) 1935 RAM

Data write ⟶ read, and accord check

Error 14: AVD RAM read data discord

The program code data stored in ROM (IC107) are copied to all areas of RAM (IC504, IC505) connected to the AVD through the bus, then they are read and checked if they accord. Further, the same test is conducted once again with the data where all bits are inverted between 1 and 0. If discord is detected, faulty address, written data, and read data are displayed following the error code 14, and the test is suspended.

During the test, OSD display becomes blank as the OSD area is also checked.

(6-3) 1935 SP

ROM ⟶ AVD RAM ⟶ Video OUT

Error: Not detected.

The data including sub picture streams in ROM are transferred to the RAM in AVD, and output as video signals from the AVD.

Though OSD display becomes blank, the output of video signals continues until the key is pressed.

7. Video Output

(7-2) Color Bar

AVD color bar command write ⟶ Video OUT

Error: Not detected.

The command is transferred to the AVD, and the color bar signals are output from video terminals.

8. Audio Output

(8-2) ARP ⟶1935

Data flow from supply system DRAM to SDRAM of AV Decoder is tested.

Error 15: ARP ⟶ 1935 video NG

16: ARP ⟶ 1935 audio NG

(8-3) Test Tone

Pink noise output

Error: Not detected.

In the models without DD output, the test tone is output from L and R of 2-channel only, and in the models with DD output, the test tone is output from L and R of 2-channel, and all channels of 5.1 output.

After turning on all outputs, each time the NEXT key is pressed, the output channel is switched for individual channel checking.

Diagnosis Check Items List

2. Version Display

(2-2) Revision
(2-3) ROM Check Sum
(2-4) Model Type
(2-5) Region
(2-6) M't Check

3. Peripheral

(3-2) EEPROM Check
(3-7) ———— (Function not supported)

4. Servo

(4-2) Servo DSP Check
(4-3) ———— (Function not supported)
(4-4) RF Amp Register Check

5. Data Supply System

(5-2) ARP Register Check
(5-3) ARP to RAM Data Bus
(5-4) ARP to RAM Address Bus
(5-5) ARP RAM Check

6. AV Decoder

(6-2) 1935 RAM
(6-3) 1935 SP

7. Video Output

(7-2) Color Bar\

8. Audio Output

(8-2) ARP ⟶1935
(8-3) Test Tone

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Error Codes List

00: Error not detected
01: RAM write/read data discord
03: EEPROM NG
04: Flash memory clear error
05: Flash memory write error
06: Flash memory read data discord
08: ARP register read data discord
09: ARP ←→ RAM data bus error
10: ARP ←→ RAM address bus error
11: ARP RAM read data discord
12: Servo DSP NG
13: RF Amp NG
14: 1935 SDRAM NG
15: ARP →1935 video NG
16: ARP →1935 audio NG
1A: System call error (Function not supported)
1B: System call error (Parameter error)
1C: System call error (Illegal ID number)
20: System call error (Time out)
22: Resistor installation error
90: Error occurred
91: User verification NG
92: Diagnosis cancelled

6-4. DRIVE AUTO ADJUSTMENT

On the Test Mode Menu screen, press [1] key on the remote commander, and the drive auto adjustment menu will be displayed.

```
   ## Drive Auto Adjustment ##

         Adjustment Menu

0. ALL
1. DVD-SL
2. CD
3. DVD-DL
4. LCD


                      Exit: RETURN
```

Normally, [0] is selected to adjust DVD (single layer), CD, and DVD (dual layer) in this order. But, individual items can be adjusted for the case where adjustment is suspended due to an error. In this mode, the adjustment can be made easily through the operation following the message displayed on the screen. Which disc is currently adjusted is displayed on the fluorescent display tube.

0. ALL

You will be asked if EEPROM data are initialized or not, and for this prompt, select [0] and press the [ENTER] key. First, the servo setting data in EEPROM, Emergency History and Hour Meter are cleared to initialize. Then, [1] DVD-SL disc, [2] CD disc, and [3] DVD-DL disc are adjusted in this order. Each time one disc was adjusted, it is ejected, and therefore exchange the disc following the message. You can exit the adjustment by pressing the [■] button. In adjusting each disc, the mirror time is measured to check the disk type. In the auto adjustment, whether the disc type is correct is not checked unlike conventional models, and accordingly, take care not to insert a different type of disc.

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1. DVD Single Layer Disc

Select [1], insert DVD single layer disc, and press [ENTER] key, and the adjustment will be made through the following steps, then adjusted values will be written to the EEPROM.

DVD Single Layer Disc Adjustment Steps

1. Sled Reset
2. Disc Check Memory SL
3. Set Disc Type SL
4. Spdl Start
5. Ld ON
6. Focus Error Check
7. Focus ON 0 with PI Level measure
8. Auto Track Offset Adjust L0
9. Trv Level Check
10. Tracking ON
11. CLVA ON
12. Sled ON
13. Auto Focus Balance Adjust
14. Auto Loop Filter Offset Adjust
15. Auto Focus Gain Adjust L0
16. Auto Focus Balance Adjust L0
17. EQ Boost Adjust
18. Auto Loop Filter Offset Adjust
19. Auto Tracking Gain Adjust
20. RF Level Measure
21. Jitter measure
22. Eep Copy Loop Filter Offset
23. All Servo Stop

2. CD Disc

Select [2], insert CD disc, and press [ENTER] key, and the adjustment will be made through the following steps, then adjusted values will be written to the EEPROM.

CD Adjustment Steps

1. Sled Reset
2. Disc Check Memory CD
3. Set Disc Type CD
4. Spdl Start
5. LD ON
6. Focus Error Check
7. Fcs ON 1 with PI Level measure
8. Auto Track Offset Adjust L0
9. Trv Level Check
10. Tracking ON
11. CLVA ON
12. Sled ON
13. Auto Focus Balance Adjust
14. Auto Loop Filter Offset Adjust
15. Auto Focus Gain Adjust L0
16. Auto Focus Balance Adjust L0
17. Eq Boost Adjust
18. Auto Loop Filter Offset Adjust
19. Auto Track Gain Adjust
20. Copy Adjustment Data to LCD
21. RF Level Measure
22. Jitter measure
23. All Servo Stop

3. DVD Dual Layer Disc

Select [3], insert DVD dual layer disc, and press [ENTER] key, and the adjustment will be made through the following steps, then adjusted values will be written to the EEPROM.

DVD Dual Layer Disc Adjustment Steps

1. Sled Reset
2. Disc Check Memory DL
3. Set Disc Type DL
   DVD DL Layer 1 Adjust
4. Spdl Start
5. LD ON
6. Fcs ON 1 with PI Level measure
7. Auto Track Offset Adjust L1
8. Tracking ON
9. Clva ON
10. Sled ON
11. Auto Focus Balance Adjust
12. Auto Focus Gain Adjust L1
13. Auto Focus Balance Adjust L1
14. Eq Boost Adjust L1
15. Auto Track Gain Adjust L1
16. Jitter measure
    DVD DL Layer 0 Adjust
17. Focus Jump (L1 → L0)
18. Auto Track Offset Adjust L0
19. Tracking ON
20. Clva ON
21. Sled ON
22. Auto Focus Balance Adjust
23. Auto Focus Gain Adjust L0
24. Auto Focus Balance Adjust
25. Eq Boost Adjust L0
26. Auto Track Gain Adjust L0
27. Jitter measure
28. All Servo Stop

4. LCD

LCD disc is not adjusted because the adjusted data of CD are reflected, and SACD (hybrid disc) is not adjusted because the adjusted data of CD and DVD-DL are reflected.

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6-5. DRIVE MANUAL OPERATION

On the Test Mode Menu screen, select [2], and the manual operation menu will be displayed. For the manual operation, each servo on/off control and adjustment can be executed manually.

```
   ## Drive Manual Operation ##

          Operation Menu
1. Disc Type
2. Servo Control
3. Track/Layer Jump
4. Manual Adjustment
5. Auto Adjustment
6. Memory Check

0. Disc Check Memory

                        Exit: RETURN
```

In using the Manual Operation menu, take care of the following points. These commands do not provide protection, thus requiring correct operation. The sector address or time code field is displayed when a disc is loaded.

1. Set correctly the disc type to be used on the Disc Type setting screen.
   The Disc Type setting must be performed after a disc was loaded.
   The set Disc Type is cleared when the tray is opened.
2. After power ON, if the Manual Operation was selected, first perform "Reset SLED TILT" by opening 1. Disc Type screen.
3. In case of an alarm, immediately press the [■] button to stop the servo operation, and turn the power OFF.

Basic operation (controllable from front panel or remote commander)

[POWER] : Power OFF
[■] : Servo stop
[⏏] (Open/Close) : Stop+Eject/Loading
[↩] : Return to Operation Menu or Test Mode Menu
[▶▶|], [|◀◀] : Transition between sub modes of menu
[1] to [9], [0] : Selection of menu and items
Cursor [↑]/[↓] : Increase/Decrease in manually adjusted value

0. Disc Check Memory

```
            Disc Check


1. SL Disc Check
2. CD Disc Check
3. DL Disc Check



0. Reset SLED TILT
```

On this screen, the mirror time is measured and written to the EEPROM to check the disc type. First, set a DVD SL disc and press [1], then set a CD disc and press [2], and finally set a DVD DL disc and press [3]. The measured mirror time is displayed respectively.
The adjustment must be executed more than once after default data were written.
From this screen, you can go to another mode by pressing [▶▶|] or [|◀◀] key, but you cannot enter this mode from another mode. You can enter this mode from the Operation Menu screen only.

1. Disc Type

```
            Disc Type
1. Disc Type Auto Check
2. DVD SL     12cm
3. DVD DL     12cm
4. CD         12cm
5. SACD       12cm
6. DVD SL     8cm
7. DVD DL     8cm
8. CD         8cm
9. LCD        8cm
0. Reset SLED TILT
                              EMG. 00
```

On this screen, select the disc type. To select the disc type, press the number of the loaded disc. The selected disc type is displayed at the bottom. Selecting [1] automatically selects and displays the disc type. In case of wrong display, retry "Disc Check Memory". Also, opening the tray causes the set disc type to be cleared. In this case, set the disc type again after loading.
In performing manual operation, the disc type must be set.

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Once the disc type has been selected, the sector address or time code display field will appear as shown below. These values are displayed when PLL is locked.

```
            Disc Type
1. Disc Type Auto Check
2. DVD SL     12cm
3. DVD DL     12cm
4. CD         12cm
5. SACD       12cm
6. DVD SL     8cm
7. DVD DL     8cm
8. CD         8cm
9. LCD        8cm
0. Reset SLED TILT
           SA.———— SI.— EMG.00
DVD SL 12cm
```

Display when DVD SL 12cm disc was selected

```
            Disc Type
1. Disc Type Auto Check
2. DVD SL     12cm
3. DVD DL     12cm
4. CD         12cm
5. SACD       12cm
6. DVD SL     8cm
7. DVD DL     8cm
8. CD         8cm
9. LCD        8cm
0. Reset SLED TILT
             TC. —:—:— EMG.00
CD       12cm
```

Display when CD 12cm disc was selected

[0] Reset SLED TILT: Reset the Sled and Tilt to initial position. (Reset the Sled only to initial position because the Tilt mechanism is not available in this model.)

[1] Disc Type Check: Judge automatically the loaded disc. As the judged result is displayed at the bottom of screen, make sure that it is correct. If Disc Check Memory menu has not been executed after EEPROM default setting, the disc type cannot be judged. In this case, return to the initial menu and make a check for three types of discs (SL, DL, CD).

[2] to [9]: Select the loaded disc. The adjusted value is written to the address of selected disc. No further entry is necessary if [1] was selected.

2. Servo Control

```
          Servo Control
1. LD         Off   R. Sled FWD
2. SP         Off   L. Sled REV
3. Focus      Off
4. TRK.       Off
5. Sled       Off
6. CLVA       Off
7. FCS. Srch  Off


0. Reset SLED TILT
            SA.———— SI.— EMG.00
DVD SL 12cm
```

On this screen, the servo on/off control necessary for replay is executed. Normally, turn on each servo from 1 sequentially and when CLVA is turned on, the usual trace mode becomes active. In the trace mode, DVD sector address or CD time code is displayed. This is not displayed where the spindle is not locked.
The spindle could run overriding the control if the spindle system is faulty or RF is not present. In such a case, do not operate CLVA.

[0] Reset SLED TILT: Reset the Sled and Tilt to initial position. (Reset the Sled only to initial position because the Tilt mechanism is not available in this model.)

[1] LD: Turn ON/OFF the laser.

[2] SP: Turn ON/OFF the spindle.

[3] Focus: Search the focus and turn on the focus.

[4] TRK.: Turn ON/OFF the tracking servo.

[5] Sled: Turn ON/OFF the sled servo. When PLL is not locked (cannot be locked), the sled servo is not turned ON. The display keeps ON.)

[6] CLVA: Turn ON/OFF normal servo of spindle servo.

[7] FCS. Srch: Apply same voltage as that of focus search to the focus drive to check the focus drive system.

→ Sled FWD: Move the sled outward. Perform this operation with the tracking servo turned off.

← Sled REV: Move the sled inward. Perform this operation with the tracking servo turned off.

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3. Track/Layer Jump

```
          Track/Layer Jump
1. 1Tj FWD    R. Fj (L1->L0)
2. 1Tj REV    L. Fj (L0->L1)
3. 2Tj FWD    U. Lj (L1->L0)
4. 2Tj REV    D. Lj (L0->L1)
5. NTj FWD
6. NTj REV
7. 500Tj FWD
8. 500Tj REV
9. 10k/20k FWD
0. 10k/20k REV
            SA.———— SI.— EMG.00
DVD DL 12cm
```

On this screen, track jump, etc. can be performed. Only for the DVD-DL, the focus jump and layer jump are displayed in the right field.

[1] 1Tj FWD: 1-track jump forward.
[2] 1Tj REV: 1-track jump reverse.
[3] 2Tj FWD: 2-track jump forward.
[4] 2Tj REV: 2-track jump reverse.
[5] NTj FWD: N-track jump forward.
[6] NTj REV: N-track jump reverse.
[7] 500Tj FWD: Fine search forward.
[8] 500Tj REV: Fine search reverse.
[9] 10k/20k FWD: Direct search forward.
[0] 10k/20k REV: Direct search reverse.

– The following commands are valid for DVD-DL disc only –

[→] (L1 → L0): Focus jump (Trk/Sled Servo OFF) forward.
[←] (L0 → L1): Focus jump (Trk/Sled Servo OFF) reverse.
[↑] (L1 → L0): Layer jump (Trk/Sled Servo ON) forward.
[↓] (L0 → L1): Layer jump (Trk/Sled Servo ON) reverse.

4. Manual Adjustment

```
    Manual Adjustment:Up/Down
1. TRK. Offset
2. Focus Gain
3. TRK. Gain
4. Focus Offset
5. Focus Balance
6. L.F. Offset
7. Analog FRSW
8. PLL Dac Gain
9. EQ BOOST
0. GD ADJ
Adjustment: Up/Down
        SA. ------ SI. -- EMG. 00
DVD SL 12cm            Jitter FF
```

On this screen, each item can be adjusted manually. Select the desired number [1] to [0] from the remote commander, and current setting for the selected item will be displayed, then increase or decrease numeric value with [↑] key or [↓] key. This value is stored in the EEPROM. If CLV has been applied, the jitter is displayed for reference for the adjustment.

[1] TRK. Offset: Adjusts tracking offset.
[2] Focus Gain: Adjusts focus gain.
[3] TRK. Gain: Adjusts track gain.
[4] Focus Offset: Adjusts focus offset.
[5] Focus Balance: Adjusts focus balance.
[6] L.F. Offset: Adjusts loop filter offset.
[7] Analog FRSW: Sets select switch of analog feedback circuit.
[8] PLL Dac Gain: Adjusts D/A converter gain of PLL.
[9] EQ BOOST: Adjusts boost amount of equalizer.
[0] GD ADJ: Adjusts group delay amount.

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5. Auto Adjustment

```
         Auto Adjustment
1. Auto TRK. Offset
2. Auto Focus Balance
3. Auto Focus Offset
4. Auto Focus Gain
5. Auto TRK. Gain
6. Auto EQ.
7. Auto L.F. Offset
8. Auto Group Delay

          SA.04EF905 SI.00 EMG.00
DVD SL 12cm
```

On this screen, each item can be adjusted automatically. Select the desired number [1] to [8] from the remote commander, and selected item is adjusted automatically.

[1] Auto TRK. Offset: Adjusts tracking offset.
[2] Auto Focus Balance: Adjusts focus balance.
[3] Auto Focus Offset: Adjusts focus offset.
[4] Auto Focus Gain: Adjusts focus gain.
[5] Auto TRK. Gain: Adjusts track gain.
[6] Auto EQ
[7] Auto L.F. Offset: Adjusts loop filter offset.
[8] Auto Group Delay

6. Memory Check

The display image is shown below and three screens in total can be selected.

```
EEPROM DATA 1                 —DL —
              CD   LCD SL   L0   L1
Focus Gain    xx   xx  xx   xx   xx
TRK. Gain     xx   xx  xx   xx   xx
FCS Balnce    xx   xx  xx   xx   xx
Focus Bias    xx   xx  xx   xx   xx
TRV Offset    xx   xx  xx   xx   xx
L.F. Offset   xx   xx  xx   xx   xx
EQ. Boost     xx   xx  xx   xx   xx
_
UP    : Last Data
DOWN  : Next Data
CLEAR : Default Set        page.1/3
```

```
EEPROM DATA 2                 —DL —
              CD   LCD SL   L0   L1
RF Jitter     xx   --  xx   xx   xx
RF Level      xx   --  xx   --   --
FE Level      xx   --  xx   --   --
FE Balance    xx   --  xx   --   --
TRV.Level     xx   --  xx   --   --
TE Gain       xx   xx  --   --   --
PI Level      xx   --  xx   xx   --
_
UP    : PREV Data
DOWN  : Next Data
CLEAR : Default Set        page.2/3
```

```
EEPROM DATA 3                  —DL —
              CD   LCD SL    L0  L1
Analog FRSW   xx   xx  xx    xx  xx
PLL Dac Gain  xx   xx  xx    xx  xx
Mirror Time   xx   xx  xx    xx  xx

_  THR A&L    xx   xx  xx/xx xx  xx
UP    : PREV Data
DOWN  : First Data
CLEAR : Default Set        page.3/3
```

On this screen, current servo adjusted data stored in the EEPROM are displayed. The adjusted data are initialized by pressing the [CLEAR] key, but be careful that they are not recoverable after initialization.
Before clearing the adjusted data, make a note of the set data. This screen will also appear if [0] All is selected in the Drive Auto Adjustment. In this case, default setting cannot be made.
"THR A&L" data on the second page cannot be changed if default setting is once made.

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6-6. MECHA AGING

```
       ### Mecha Aging ###



Press OPEN key



Abort : STOP key
```

On the Test Mode Menu screen, selecting [3] executes the aging of mechanism. First, open the tray and load a disc. Press the [▷] key, and the aging will start. During aging, the number of the repeat cycle is displayed. Aging can be aborted at any time by pressing the [■] key. After the operation has stopped, unload the disc and press again the [■] key or the [⏏] key to return to the Test Mode Menu.

6-7. EMERGENCY HISTORY

```
       ### EMG. History ###

Laser Hours   CD   xxhxxm
              DVD  xxhxxm

 1.  00 00 00 00   00 00 00 00
     00 00 00 00   00 00 00 00

 2.  00 00 00 00   00 00 00 00
     00 00 00 00   00 00 00 00

Select : 1-9      Scroll :UP/DOWN
(1: Last EMG.)    Exit   :RETURN
```

On the Test Mode Menu screen, selecting [4] displays the information such as servo emergency history. The history information from last "1" up to "10" can be scrolled with [↑] key or [↓] key. Also, specific information can be displayed by directly entering that number with the ten-key pad from [1] to [9].
(Emergency history code is shown separately.)
The upper two lines display the laser ON total hours. Data below minutes are omitted.

Clearing History Information

◎ Clearing laser hours
Press [DISPLAY] and [CLEAR] keys in this order.
Both CD and DVD data are cleared.
◎ Clearing emergency history
Press [TOP MENU] and [CLEAR] keys in this order.
◎ Initializing setup data
Press [MENU] and [CLEAR] keys in this order.
The data have been initialized when "Set Up Initialized" message is displayed.
The EMG. History display screen will be restored soon.

6-8. VERSION INFORMATION

```
   ### Version Infomation ###

IF con.       Ver.x.xxx(xxxx)
              Group   xx

SYScon.       Ver.x.xxx(xxxx)
              Model   xx
              Region  0x

 Servo DSP Ver:x.xxx
 AVD ucode Ver:xxxxxxxx
 OPT TYPE : x LASER
Exit : RETURN
```

The ROM version, region code, OPT type, etc. are displayed if [5] is selected in the Test Mode Menu. The parenthesized hexadecimal number in the version number field indicates the checksum value of the ROM.

∗ Note after Downloading
After downloading ROM data, sometimes it happens that checksum is not the same as that of ROM data that has been downloaded. In such a case, go back to the menu screen and select "0. Syscon Diagnosis", then select "1. All" in "2. Version". If the result of this operation does not give an agreement, it must be either Download error or ROM error.

6-9. VIDEO LEVEL ADJUSTMENT

On the Test Mode Menu screen, selecting [6] displays color bars for video level adjustment. During display of color bars, OSD disappears but the menu screen will be restored if pressing any key.

6-10. IF CON SELF DIAGNOSTIC FUNCTION

1. IF-92 BOARD (IF CON) TEST MODE

The front board test mode is the IF CON self diagnostic mode. The IF CON can diagnose the functions of the front panel boards that the IF CON controls. Normally, the IF CON makes a serial communication with the SYSTEM CONTROL and operates following the commands from the SYSTEM CONTROL, but in the Test mode, the IF CON operates independently from the SYSTEM CONTROL.

In the Test mode, the following functions can be checked.
1. Button function
2. Remote commander receiving function
3. SYSTEM CONTROL-IF CON serial communication
4. Click shuttle function
5. Fluorescent display tube lighting check
   Grid check
   Anode check
6. LED control function

In the Test mode, the set operates same as usual, except voltage monitoring, communication monitoring, display of fluorescent display tube, and LED control.
1. The routine that monitors +3.3 V (P-CONT) of MB-103 board is not provided.
2. The monitoring timer for serial communication with the SYSTEM CONTROL is not provided. The set is not placed in the Standby mode, even if the communication with SYSTEM CONTROL is normal.
3. Display of fluorescent display tube (normally, display is made following the commands from SYSTEM CONTROL)
4. LED control (normally, control is made following the commands from SYSTEM CONTROL)

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2. OPERATION OF SELF CHECK MODE

The Self Check mode is the function to conduct the basic test to the FL display and DVD panel section.

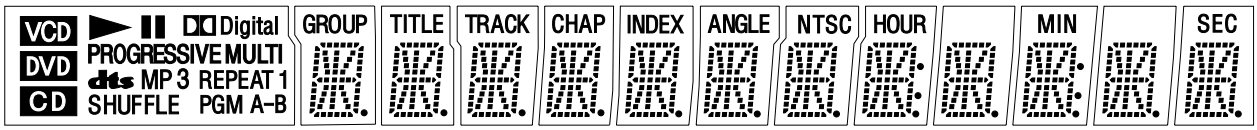
2-1. Self Check Mode Transition Processing

At the AC Power ON after IF CON (IC404) was reset, the input to 10pin (SELF CHECK) is judged and if "Low" is entered, the main unit transits to the Self Check mode. In this port input judgment, the result of 3-time attempts must be same (assuming that the MB-103 board is not connected). While pressing the [STOP] key on the main unit with the IF CON in STANDBY mode, enter [RETURN] → [DISPLAY] (or [SET UP]) on the remote commander, and the unit transits to the Self Check Mode. The Self Check mode terminates when the IF CON transits to the STANDBY mode.

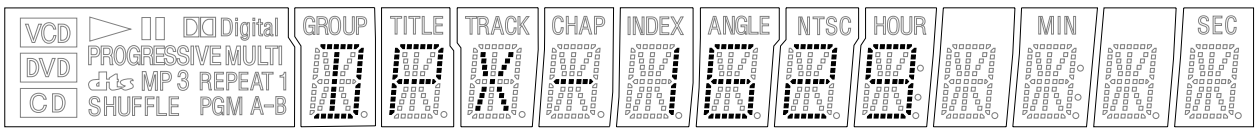
2-2. Operation of Auto Self Check

When the Self Check mode becomes active at the AC Power ON or by key input, the test display of the following steps (1) to (4) is repeated.

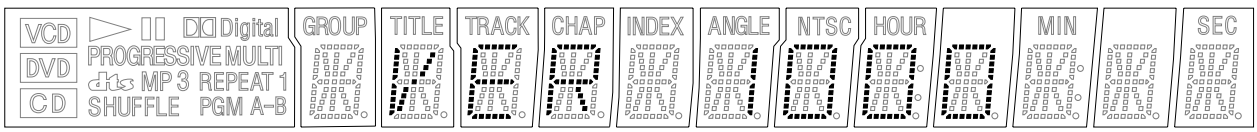
(1) FLD and LED all ON (for 5 seconds)



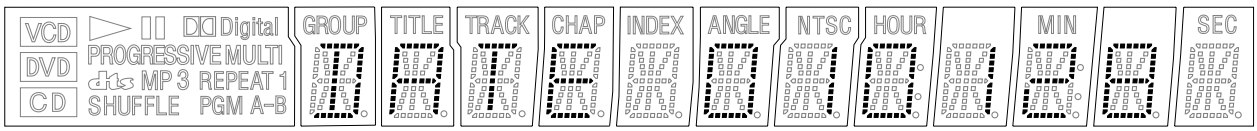
(2) MODEL display (for 2 seconds)



(3) Version display (for 2 seconds)



(4) ROM creation date display (for 2 seconds)



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2-3. Each Self Check Function

Each Self Check function tests the FLD display, LED display, and key input.

Input Voltage [V]	IC404: Pin No. (Signal)				
	Pin ㊲ (POWER)	Pin ㉞ (O/C)	Pin ㉟ (PLAY)	Pin ㊱ (DISPLAY)	Pin ㉝ (CURSOR)
0 – 0.2	POWER	OPEN/CLOSE	PLAY	STOP	ENTER
0.6 – 0.82	TVS	PREVIOUS	–	DISPLAY	DOWN
1.16 – 1.47	PREQ	PAUSE	–	MENU	LEFT
1.8 – 2.12	–	NEXT	–	RETURN	UP
2.48 – 2.7	–	–	–	TOP MENU	RIGHT
3.3	–	–	–	–	–

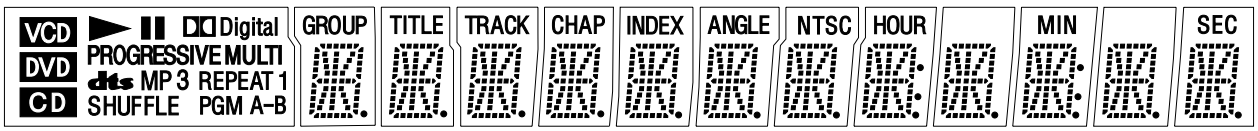
2-3-1. FLD and LED All ON

2-3-1-1. Transition Keys in Self Check Mode

- [STOP] key and [OPEN/CLOSE] key on the main unit
- [LEFT] key on the main unit and the remote commander

2-3-1-2. Operation and Display

In this mode, all LEDs except STANDBY LED and all segments of FLD turn ON.
Example of FLD all ON



2-3-2. Main Unit Key Name Display and Key Code Display

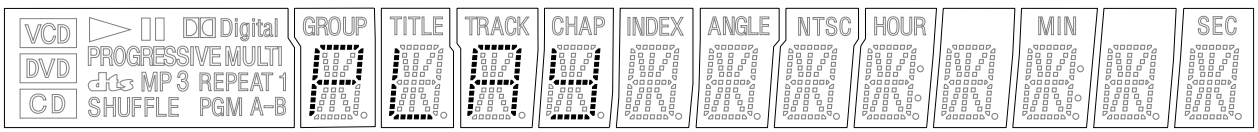
2-3-2-1. Transition Keys in Self Check Mode

- Keys on main unit except keys transited in self check

2-3-2-2. Operation and Display

When a key on the main unit is pressed in the Self Check mode, the name of that key is displayed on the FLD. Also, the key name display and the key code display can be switched with the [DISPLAY] key on the remote commander. “NOTHING” is displayed when nothing is entered. Also, VIDEO CD, DVD, and CD segments turn on when a communication error occurred.

FLD display (at input of [PLAY] key on the main unit)



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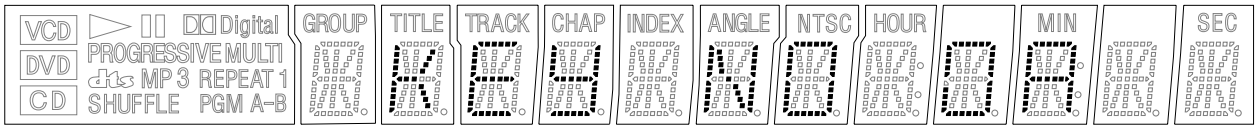
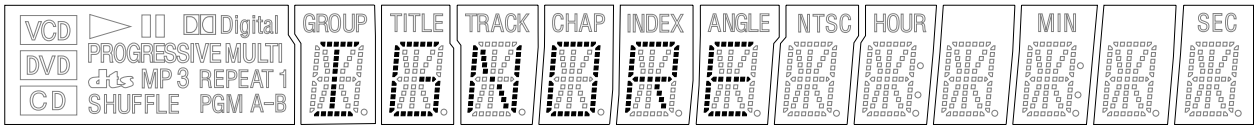
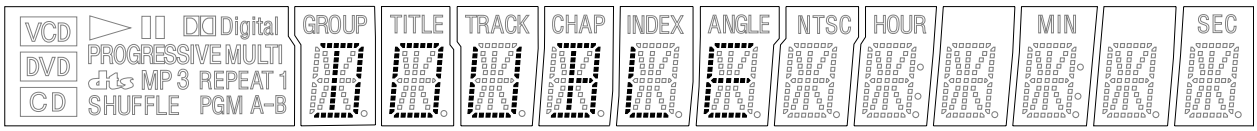
Key code display (at input of PLAY key, Key code: 0Ah)



At input of faulty voltage



When two keys are pressed



2-3-3. Remote Commander Key Name Display and Key Code Display

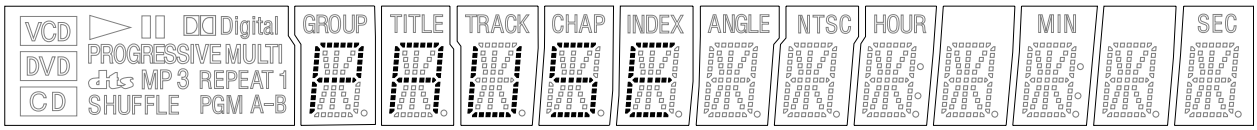
2-3-3-1. Transition Keys in Self Check Mode

- Remote commander keys except keys transited in self check

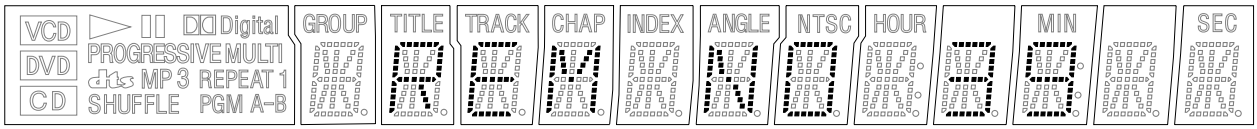
2-3-3-2. Operation and Display

When a key on the remote commander is pressed in the Self Check mode, the name of that key is displayed on the FLD. Also, the key name display and the key code display can be switched with the DISPLAY key on the remote commander. “NOTHING” is displayed when nothing is entered. Also, VIDEO CD, DVD, and CD segments turn on when a communication error occurred.

Remote commander key name display (at input of PAUSE key)



Remote commander key code display (at input of PAUSE key, Key code: 39h)



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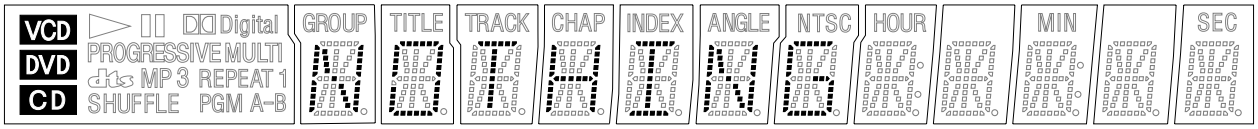
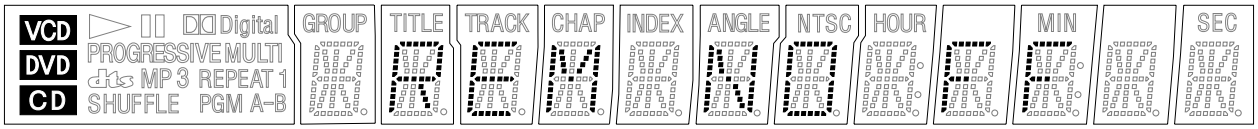
2-3-4. Communication Monitoring Display

The communication state is monitored and displayed while the key name on the main unit and the remote commander is displayed. When the communication to the System Controller failed, VIDEO CD, DVD, and CD segments turn on.

Communication error display (at no key input)



Communication error display (at code display without input of the remote commander)



2-3-5. FLD Anode Test Display and SHUTTLE Click Operation Test

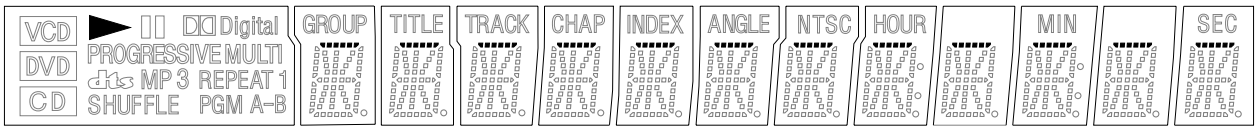
2-3-5-1. Transition Keys in Self Check Mode

- RIGHT on the main unit and the remote commander
- SHUTTLE on the remote commander during Anode Test display
  (This model does not provide JOG/SHUTTLE, and therefore use another DVD remote commander having the JOG/SHUTTLE)

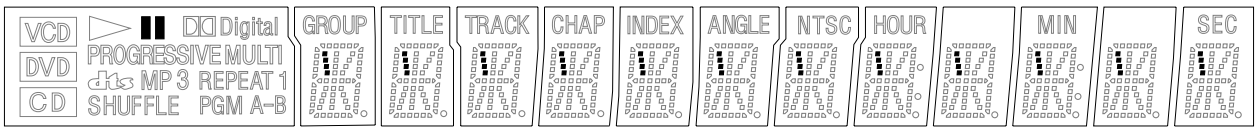
2-3-5-2. Operation and Display

The Self Check mode transits to this mode when RIGHT key is entered. Only the first segment of each grid of FLD turns on, and each time the SHUTTLE is entered, the segment of each grid is switched in order. When SHUTTLE input is clockwise, the segment switches in 1 → 2 → 3 direction, or counterclockwise it switches in 3 → 2 → 1 direction. This tests whether each segment turns on individually.

Display at the start of Anode Test



↓ (Input in CW direction)



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2-3-6. FLD Grid Test Display and SHUTTLE Click Operation Test

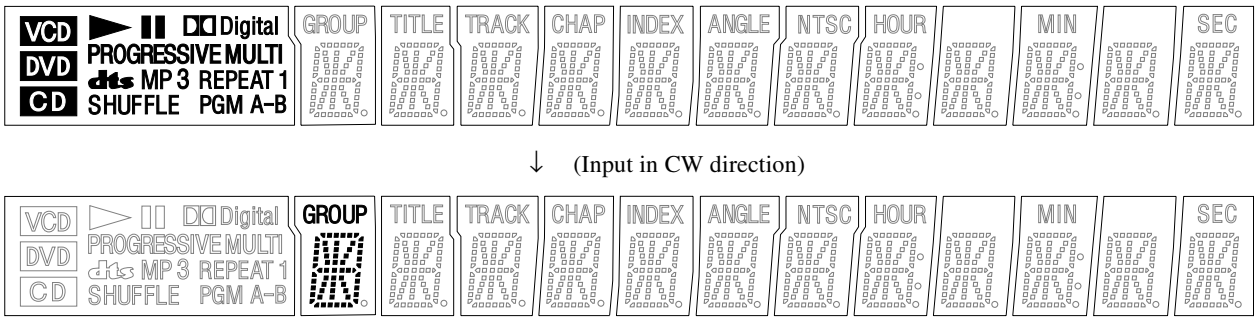
2-3-6-1. Transition Keys in Self Check Mode

- UP on the main unit and the remote commander
- SHUTTLE on the remote commander during Grid Test display (This model does not provide JOG/SHUTTLE, and therefore use another DVD remote commander having the JOG/SHUTTLE)

2-3-6-2. Operation and Display

The Self Check mode transits to this mode when UP key is entered. The first grid of FLD all turns on and other grids turn off. Each time the SHUTTLE is entered, the grid is switched in order. When SHUTTLE input is clockwise, the grid switches in 1 → 2 → 3 direction, or counterclockwise it switches in 3 → 2 → 1 direction. This tests whether each grid turns on individually.

Display at the start of Grid Test



↓ (Input in CW direction)

2-3-7. LED Test Display

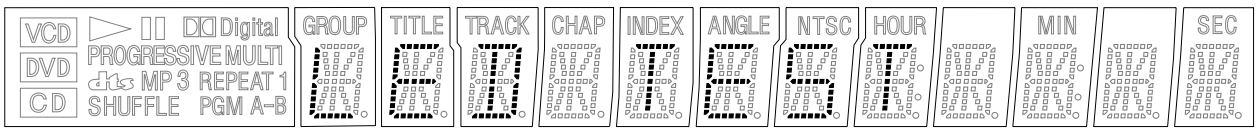
2-3-7-1. Transition Keys in Self Check Mode

- DOWN on the main unit and the remote commander
- SHUTTLE on the remote commander during LED Test display (This model does not provide JOG/SHUTTLE, and therefore use another DVD remote commander having the JOG/SHUTTLE)

2-3-7-2. Operation and Display

LED is switched in order by the input of JOG/SHUTTLE. Also, LED ON/OFF is switched by the input of same key as the function that turns on the LED concerned.

FLD display during LED Test



2-3-8. Beep Sound Test

2-3-8-1. Transition Keys in Self Check Mode

- Input of a key on main unit

2-3-8-2. Operation and Display

In the Self Check mode, each time a key on the main unit is entered, a beep sound of 1kHz (100ms) is generated.

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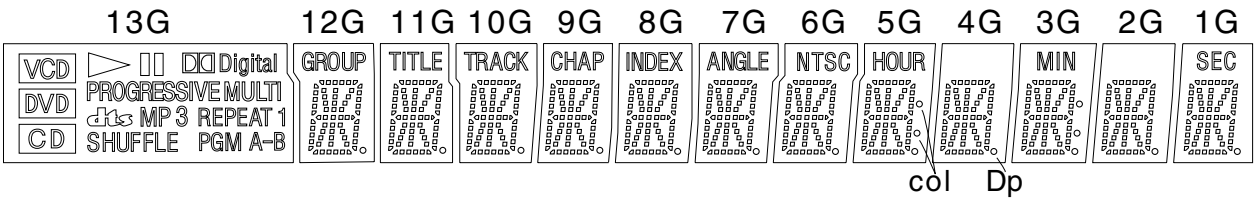
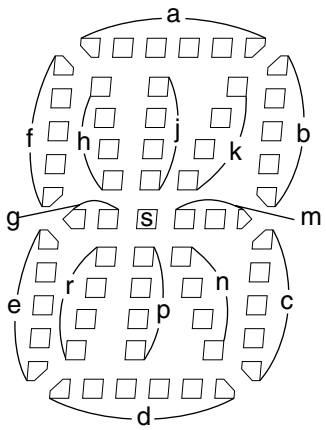
GRID ASSIGNMENT





(12G-1G)

ANODE CONNECTION

	13G	12G	11G	10G	9G	8G	7G	6G	5G	4G	3G	2G	1G
P1	▷	a	a	a	a	a	a	a	a	a	a	a	a
P2	□□	h	h	h	h	h	h	h	h	h	h	h	h
P3	—	j	j	j	j	j	j	j	j	j	j	j	j
P4	□□ Digital	k	k	k	k	k	k	k	k	k	k	k	k
P5	PROGRESSIVE	b	b	b	b	b	b	b	b	b	b	b	b
P6	—	f	f	f	f	f	f	f	f	f	f	f	f
P7	MULTI	m	m	m	m	m	m	m	m	m	m	m	m
P8	dts	s	s	s	s	s	s	s	s	s	s	s	s
P9	MP3	g	g	g	g	g	g	g	g	g	g	g	g
P10	REPEAT	e	e	e	e	e	e	e	e	e	e	e	e
P11	1	n	n	n	n	n	n	n	n	n	n	n	n
P12	SHUFFLE	p	p	p	p	p	p	p	p	p	p	p	p
P13	PGM	r	r	r	r	r	r	r	r	r	r	r	r
P14	A-	c	c	c	c	c	c	c	c	c	c	c	c
P15	B	d	d	d	d	d	d	d	d	d	d	d	d
P16	VCD	Dp	Dp	Dp	Dp	Dp	Dp	Dp	Dp	Dp	Dp	Dp	—
P17	DVD	—	—	—	—	—	—	—	col	—	col	—	—
P18	CD	GROUP	TITLE	TRACK	CHAP	INDEX	ANGLE	NTSC	HOUR	—	MIN	—	SEC

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6-11. TROUBLESHOOTING

6-11-1. Cannot Enter Test Mode

You cannot enter the Test mode when either button has been pressed by any reason with the board assembled in the front panel. In this state, the power does not turn on even under normal condition (the unit is kept in standby state), and also no button is active and the remote commander is not accepted. In this case, disconnect the MB-103 board and AV-63 board, and with the SELF CHECK (pin ⑩) of IF CON (IC404) on the IF-92 board kept in low state, supply AC, and the IF CON self-diagnosis mode will be forcibly activated. The IF CON (IC404) checks the SELF CHECK port only after the power on reset (only at AC supply, not in standby state). If any button is pressed, its name is displayed on the fluorescent display tube. But, if other than "NOTHING" is displayed though no button is pressed, it means that any button has been pressed.

6-11-2. Faults in Test Mode (MB-103 board)

1. The test mode menu is not displayed.

1-1. Board visual check

Check that the ICs of SYSCON (IC104), ROM (IC106), AVD (IC403), ARP & SERVO (IC301) are working correctly.
Check that outside appearance of the ICs is normal.
Check that IC pins are not short-circuited.
Check that there is no soldering error.
Check that outside appearance of the capacitors and resistors is normal.

1-2. Power supply voltage check

Check the power voltage of the power connector (CN102).
Check the power voltage of SYSCON (IC104).
Check the power voltage of ROM (IC106).
Check the power voltage of AVD (IC403).
Check the power voltage of ARP & SERVO (IC301).
If the power voltage has any abnormality →
Check that the power supply lines are not shorted.
Check that there is no soldering error.
If any abnormality cannot be found still →
Check that each IC is working normally.

1-3. Clock signal check

Measure the clock signal frequency at CPUCK (CL101) of SYSCON (IC104) with an oscilloscope.
If the 8.25 MHz signal appears. → Check the machine according to section 1-3-1
If the 33 MHz signal appears. → Check the machine according to section 1-3-2.
If other frequencies are output.
R110 and R113 have defective soldering, X101 crystal oscillator is defective.
If the measurement point is fixed to either "H" or "L". →
Observe XFRRST (pin-⑯) of SYSCON (IC104) with an oscilloscope.
If the measurement point is "L", check the following items.
If the IC has defective soldering, if the IC is short-circuited.
If the measurement point is "H",
→ Component X101 or SYSCON (IC104) is defective.

1-3-1. When the 8.25 MHz signal appears at CPUCK

• Check the XRD, XWRH and CS0X signal.
Observe XRD (pin-⑦⓪), XWRH (pin-⑦①), and CS0X (pin-⑤⑧) of SYSCON (IC104) with an oscilloscope.
If these pins are fixed to either "L" (0V) or "H" (3.3V), or if these pins stay in the center voltage, check the followings.
Check if the signal line does not have the defective soldering.
Check if the signal line is short-circuited with other signal lines.
If you cannot find any problem → SYSCON (IC104) is defective.

• HA [0 to 21] signal and HD [0 to 15] signal check
Observe HA [0 to 21] (pins-⑩② to ⑩⑨, ⑪① to ⑪⑧, ⑫⓪, ① to ⑤) of SYSCON (IC104) and HD [0 to 15] (pins-⑧⑤ to ⑩⓪) with an oscilloscope.
If these pins are fixed to either "L" (0V) or "H" (3.3V), or if the HA pin stays in the center voltage, check the followings. (HD stays in the center voltage when it is normal.)
→ Check if the signal line does not have the defective soldering, or is short-circuited with other signal line or SYSCON (IC104) is defective.

• Reset signal check
Check if XFRRST (pin-⑯) of SYSCON (IC104) normal or not.
The signal starts up at the same time as Vcc → Defective soldering.

If the trouble does not apply to any of the above-described phenomenon, SYSCON (IC104) or ROM (IC106) is defective.

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1-3-2. When the 33 MHz signal appears at CPUCK

• WAIT signal check

Observe XWAIT (pin-⑥⑦) of SYSCON (IC104) with an oscilloscope.

If it is fixed to "L" (0V). ⟶ Observe CS2X to CS5X (pins-⑥⓪ to ⑥③).

If CS2X or CS3X is "L". ⟶ AVD (IC403) has defective soldering or AVD is defective.

If CS4x or CS5X is "L". ⟶ ARP & SERVO (IC301) has defective soldering or ARP & SERVO is defective.

If any one of the above is not "L". ⟶ XWAIT or CSnX is short-circuited or has the defective soldering or AVD (IC403) is defective or ARP & SERVO (IC301) is defective.

Center voltage ⟶ The XWAIT line has defective soldering or is short-circuited or AVD (IC403) is defective or ARP & SERVO (IC301) is defective or SYSCON (IC104) is defective.

• CSnX signal check

Observe CS0X to CS5X (pins-⑤⑧ to ⑥③) of SYSCON (IC104) with an oscilloscope.

If they are fixed to "L" (0V) or if to center voltage ⟶ Check that the ICs do not have the defective soldering or is short-circuited with the other signal lines or SYSCON (IC104) is defective.

CS0X: ROM (IC106)
CS2X, CS3X: AVD (IC403)
CS4X, CS5X: ARP & SERVO (IC301)

If the trouble symptom does not apply to any of the above phenomenon, SYSCON (IC104) or ROM (IC106) is defective.

2. Test mode menu is displayed but the machine stops when menu is selected

2-1. AVD (IC403) check

Observe SDCLKO (pin-⑫⑦) of AVD (IC403) with an oscilloscope.

95 MHz ⟶ No problem

27 MHz ⟶ Observe the XRST, HA, HD, XRD, XWRH INT and CS signal waveform at the respective pins of AVDEC, AVD (IC403) is defective.

If the signal is other than the above frequencies ⟶ AVD (IC403) 27MHz signal line (CLKI (pin-⑮⑧), SCLKIN (pin-⑯⓪)) is short-circuited, IC mount is defective, AVD (IC403) is defective, PLL (IC103) is defective.

2-2. INT signal check

Observe INT0 to 2 (pins-⑯ to ⑱) of SYSCON (IC104) with an oscilloscope.

If they are fixed to "L" (0V) or fixed to the center voltage ⟶ Check that the ICs do not have the defective soldering, or are short-circuited, SYSCON (IC104) is defective, or the following ICs are not defective.

INT0: AVD (IC403)
INT1, INT2: ARP & SERVO (IC301)

2-3. If any abnormality cannot be confirmed by the above-described checks, check the CS signal that is currently output.

The CS signal other than CS0X is being output. ⟶ IC mount is defective or the IC is defective depending on the moving CS signal.

CS2X, CS3X: AVD (IC403)
CS4X, CS5X: ARP & SERVO (IC301)

If the trouble is not applicable to any of the above phenomenon, SYSCON (IC104) or ROM (IC106) is defective.

3. If the message "SDSP No Ack" appears after the menu is displayed.

3-1. ARP & SERVO clock signal check

Check frequency of CLKIN (pin-⑮⓪)

33 MHz ⟶ Normal

Frequency other than 33 MHz ⟶ CLKIN is short-circuited or defective soldering or PLL (IC103) is defective or ARP & SERVO (IC301) is defective

3-2. ARP & SERVO (IC301) PLL oscillation check

Observe PLCKO (pin-⑧⑦) of ARP & SERVO (IC301) with an oscilloscope.

If the pin is fixed to either "L" (0V) or "H" (3.3V).

If XRST if fixed to "L". XRST has the defective soldering, In all other cases. ARP & SERVO (IC301) is defective

If it is oscillating.

HA [0 to 7] are HD [8 to 15] are short-circuited, check XSDSPIT and XSDSPCS or ARP & SERVO (IC301) is defective.

4. If trouble occurs at the specific item of the "Diag All Check".

IC mount of the NG item is defective or IC is defective.

5. Picture and audio are not output.

Check connection of CN601

Check for the defective connection of flat cable and check of damage of the flat cable.

6. Picture is output but audio is not output.

Check the audio data output (at pins-②④, ②⑧, and ②⑨) of AVD (IC403)

The audio data is not output. ⟶ AVD (IC403) or audio DAC (IC601) mount is defective or power supply is defective or AVD (IC403) or audio DAC (IC601) is defective.

PLL (IC103) 512fs output check

If the frequency or waveform has abnormality. ⟶ The signal line has defective soldering or the signal line is short-circuited with other signal lines or PLL (IC103) is defective.

7. Audio is output but picture is not output.

Observe pins-⑤⑤, ⑤⑦, ⑤⑨, ⑥①, ⑥③ and ⑥⑤ of AVD (IC403) with an oscilloscope.

If the analog signal is not output. ⟶ The signal line has the defective soldering or is short-circuited or parts are defective or AVD (IC403) is defective.

6-11-3. Drive Auto Adjustment stops due to error.

The ARP & SERVO (IC301) analog circuit of MB-103 board is defective or RF-Amp (IC201) or M-Driver (IC202) peripheral circuit is defective or optical pickup block is defective or flat cable connection is defective

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6-11-4. The product itself is defective.

• If MB-103 board does not have any problem,

The board other than MB-103 board is defective or connection is defective or optical pickup block is defective or mechanism deck is defective

1. Power LED does not light in Red when the AC power is turned on.

Check the EVER –13V (pin-③), EVER+3.3V (pin-⑪), EVER+11V (pin-⑬) voltage of the power supply block CN201.

If voltage is abnormal. ⟶ The power supply block is defective.

2. Power LED does not light in green after transmitting the POWER on command. It remains lighting in red (in the STANDBY mode).

2-1. Check the EVER -13V (pin-③), EVER+3.3V (pin-⑪), EVER+11V (pin-⑬) voltage at CN201 of the power supply block/

If voltage is abnormal. ⟶ The power supply block is defective.

2-2. Check if the fuse on the IF board has blown of not.

If the fuse has blown ⟶ Replace the fuse.

2-3. Check the P-CONT (pin-②) at CN401 of the IF-92 board when the POWER button is pressed.

If it remains at "L",

⟶ The signal line has the defective soldering or it is short-circuited with other signal lines or capacitor or resistor is defective or IFCON is defective or connection between the power supply block and the IF-92 board is defective, or connector installation is defective, or the power supply block is defective.

2-4. Check if the button is kept depressed in the IFCON self mode.

If the button is kept depressed. ⟶ The front panel is defective, or IF-92 board is defective.

2-5. Check PONCHK (pin-㉚) of IFCON (IC404) on the IF-92 board.

If it is 0.5 V or more. ⟶ The power supply is defective, or IF-92 board is defective.

3. Power LED becomes red (STANDBY mode) in at once through Power LED lights in Green once when the POWER button is pressed.

3-1. Check CN201 voltage of the power supply block when the LED lights in green.

If voltage is abnormal. ⟶ The power supply block is defective, or the IF-92 board is defective, or MB-103 board is defective

3-2. Check XFRRST (pin-⑧) at CN101 on the MB-103 board.

If it is fixed to "L". ⟶ The signal line has defective soldering, or is short-circuited with other signal lines, or parts are defective.

3-3. Check IFBSY (pin-⑤), XIFCS (pin-⑥), SI0 (pin-④), SO0 (pin-①) and SC0 (pin-③) at CN101

If they are fixed to "H" or "L".

⟶ The signal line has defective soldering, or is short-circuited with other signal line, or parts are defective, or SYSCON (IC104) is defective

If they change between "L/H".

Connector installation is defective, or the IF-92 board is defective, or SYSCON (IC104) is defective.

If they stay in the center voltage.

Poor connection of flexible wiring board such as it is inserted in an angle diagonally, or defective soldering, or is short-circuited with other signal line.

3-4. Check PONCHK (pin-㉚) of IFCON (IC404) on the IF-92 board.

If rise-up time from 0.5 V to 1.5 V or more takes longer time, or it does not exceed 1.5 V or more. ⟶ The IF board is defective.

4. The LED lights in green but the FL display does not light when the POWER button is pressed.

Connection between the power supply block and the IF-92 board is defective, or connector installation is defective, or the IF-92 board is defective.

5. Both picture and audio are not output.

Connection between the power supply block and the IF-92 board is defective, or connection between the IF-92 board and the AV-63 board is defective, or connection between the AV-63 board and the MB-103 board is defective, or connector installation is defective, or AV-63 board is defective.

6. Picture is not normal. (Block noise or others appear.)

The MB-103 board AVD (IC403) or SDRAM (IC404, IC405) is defective, or ARP & SERVO (IC301) is defective.

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SECTION 7
ELECTRICAL ADJUSTMENT

In making adjustment, refer to 7-3. Adjustment Related Parts Arrangement.

Note: During diagnostic check, the characters and color bars can be seen only with the NTSC monitor. Therefore, for diagnostic check, use the monitor that supports both NTSC and PAL modes.
Use the reference disc for PAL for check, and use the reference disc for NTSC for adjustment.

This section describes procedures and instructions necessary for adjusting electrical circuits in this set.

Instruments required:

1) Color monitor TV
2) Oscilloscope 1 or 2 phenomena, band width over 100 MHz, with delay mode
3) Frequency counter (over 8 digits)
4) Digital voltmeter
5) Standard commander (RMT-127E)
6) DVD reference disc
   HLX-501 (J-6090-071-A) (dual layer) (NTSC)
   HLX-503 (J-6090-069-A) (single layer) (NTSC)
   HLX-504 (J-6090-088-A) (single layer) (NTSC)
   HLX-505 (J-6090-089-A) (dual layer) (NTSC)
   HLX-506 (J-6090-077-A) (single layer) (PAL)
   HLX-507 (J-6090-078-A)(dual layer) (PAL)
7) SACD reference disc
   HLXA-509 (J-6090-090-A)
8) Extention Cable (J-6090-107-A)

7-1. POWER SUPPLY CHECK

1. HS11S1U/HS11S1F/ETXNY381N2F Boards

Mode	E-E
Instrument	Digital voltmeter
EVER +3.3 V Check	
Test point	CN201 pin ⑪
Specification	3.5 ± 0.2 Vdc
SW +3.3 V Check	
Test point	CN201 pin ⑧
Specification	3.3 ± 0.2 Vdc
+5 V Check	
Test point	CN201 pin ⑫
Specification	5.0 ± 0.3 Vdc
SW +11 V Check	
Test point	CN201 pin ⑥, ⑦
Specification	11.0 ± 1.0 Vdc
EVER +11 V Check	
Test point	CN201 pin ⑬
Specification	11.0 ± 1.0 Vdc
EVER –13 V Check	
Test point	CN201 pin ③
Specification	–13.0 ± 1.0 Vdc

Checking method:

1) Confirm that each voltage satisfies the specification.

Note
Because the heatsink installed on the power supply board is a part of the primary side, never touch it to avoid electrical shock.

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7-2. ADJUSTMENT OF VIDEO SYSTEM

1. Video Level Adjustment (MB-103 BOARD)

<Purpose>

This adjustment is made to satisfy the NTSC/PAL standard, and if not adjusted correctly, the brightness will be too large or small.

Mode	Video level adjustment in test mode
Signal	Color bars
Test point	LINE OUT (VIDEO) connector (75 Ω terminated)
Instrument	Oscilloscope
Adjusting element	RV401
Specification	1.0 $^{+0.04}_{-0.02}$ Vp-p

Adjusting method:

1) In the test mode initial menu "6" Video Level Adjustment, set so that color bars are generated.
2) Adjust the RV501 to attain 1.0 $^{+0.04}_{-0.02}$ Vp-p.

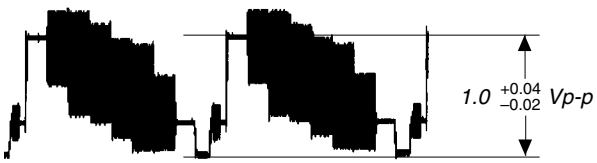

Fig.7-1.

2. Checking S Video Output S-Y

<Purpose>

Check S-terminal video output. If it is incorrect, pictures will not be displayed correctly in spite of connection to the TV with a S-terminal cable.

Mode	Video level adjustment in test mode
Signal	Color bars
Test point	S VIDEO OUT (S-Y) connector (75 Ω terminated)
Instrument	Oscilloscope
Specification	1.0 ± 0.05 Vp-p

Checking method:

1) In the test mode initial menu "6" Video Level Adjustment, set so that color bars are generated.
2) Confirm that the S-Y level is 1.0 ± 0.05 Vp-p.

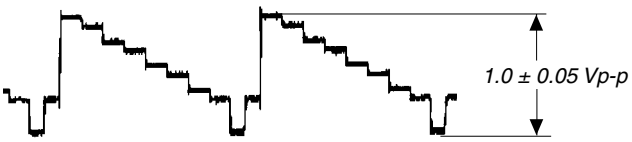

Fig.7-2.

3. Checking S Video Output S-C

<Purpose>

This checks whether the S-C satisfies the NTSC/PAL Standard. If it is not correct, the colors will be too dark or light.

Mode	Video level adjustment in test mode
Signal	Color bars
Test point	S VIDEO OUT (S-C) connector (75 Ω terminated)
Instrument	Oscilloscope
Specification	A = 286 ± 30 mVp-p (NTSC) A = 300 ± 100 mVp-p (PAL)

Checking method:

1) In the test mode initial menu "6" Video Level Adjustment, set so that color bars are generated.
2) Confirm that the S-C burst is "A".

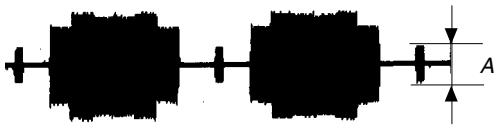

Fig.7-3.

4. Checking Component Video Output Y

<Purpose>

This checks component video output Y. If it is incorrect, correct brightness will not be attained when connected to, for instance, projector.

Mode	Video level adjustment in test mode
Signal	Color bars
Test point	COMPONENT VIDEO OUT (Y) connector (75 Ω terminated)
Instrument	Oscilloscope
Specification	1.0 ± 0.05 Vp-p

Checking method:

1) In the test mode initial menu "6" Video Level Adjustment, set so that color bars are generated.
2) Confirm that the Y level is 1.0 ± 0.05 Vp-p.

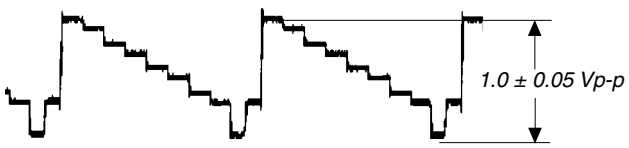

Fig.7-4.

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5. Checking Component Video Output B-Y

<Purpose>

This checks component video output B-Y. If it is incorrect, correct colors will not be displayed when connected to, for instance, projector.

Mode	Video level adjustment in test mode
Signal	Color bars
Test point	COMPONENT VIDEO OUT (P_B) connector (75 Ω terminated)
Instrument	Oscilloscope
Specification	700 ± 50 mVp-p

Checking method:

1) In the test mode initial menu “6” Video Level Adjustment, set so that color bars are generated.
2) Confirm that the B-Y level is 700 ± 50 mVp-p.

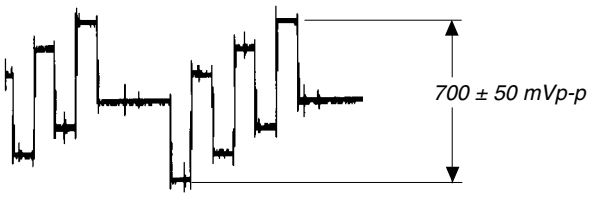

Fig.7-5.

6. Checking Component Video Output R-Y

<Purpose>

This checks component video output R-Y. If it is incorrect, correct colors will not be displayed when connected to, for instance, projector.

Mode	Video level adjustment in test mode
Signal	Color bars
Test point	COMPONENT VIDEO OUT (P_R) connector (75 Ω terminated)
Instrument	Oscilloscope
Specification	700 ± 50 mVp-p

Checking method:

1) In the test mode initial menu “6” Video Level Adjustment, set so that color bars are generated.
2) Confirm that the R-Y level is 700 ± 50 mVp-p.

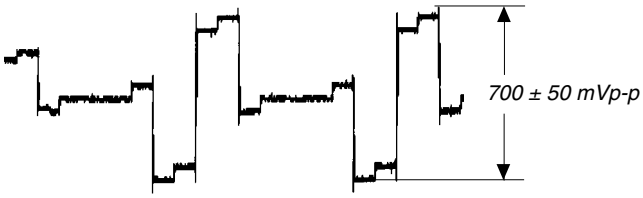

Fig.7-6.

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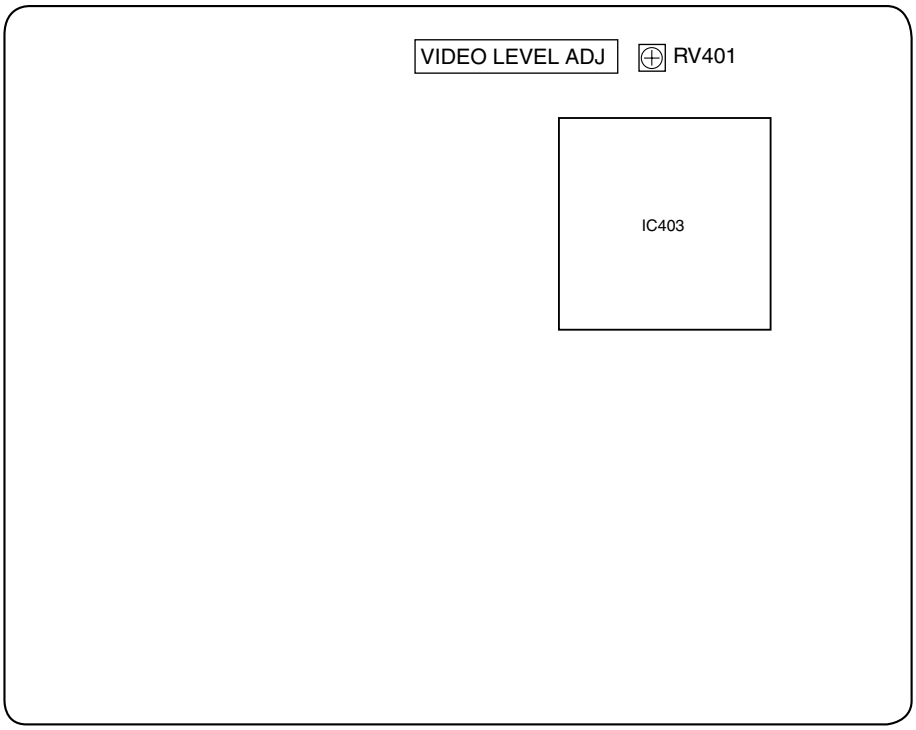
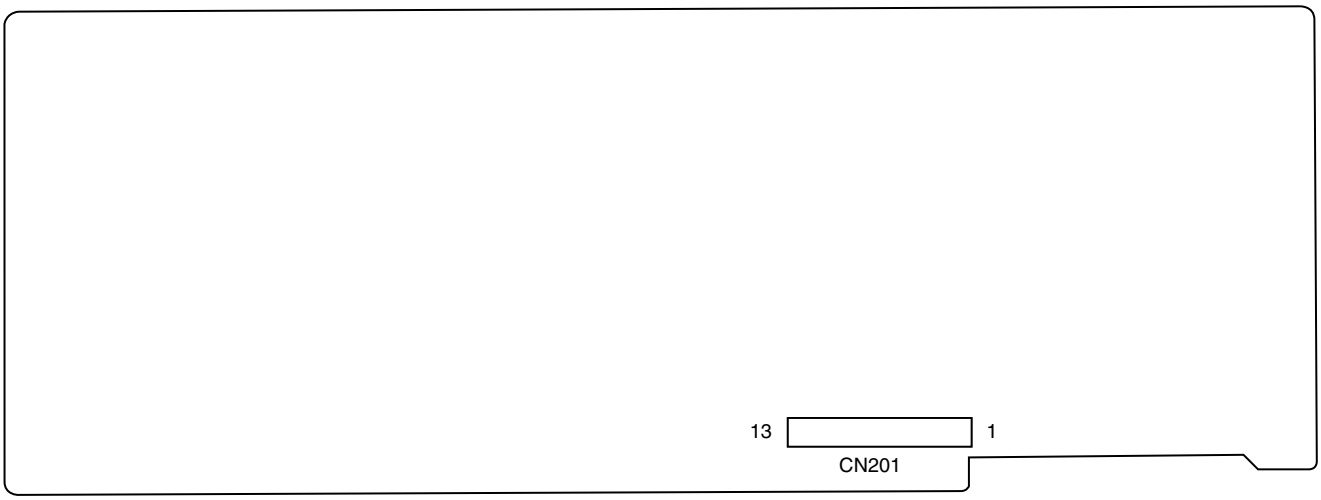
7-3. ADJUSTMENT RELATED PARTS ARRANGEMENT

MB-103 BOARD (Side A)



HS11S1U/HS11S1F/ETXNY381N2F BOARDS (Side A)



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SECTION 8
REPAIR PARTS LIST

8-1. EXPLODED VIEWS

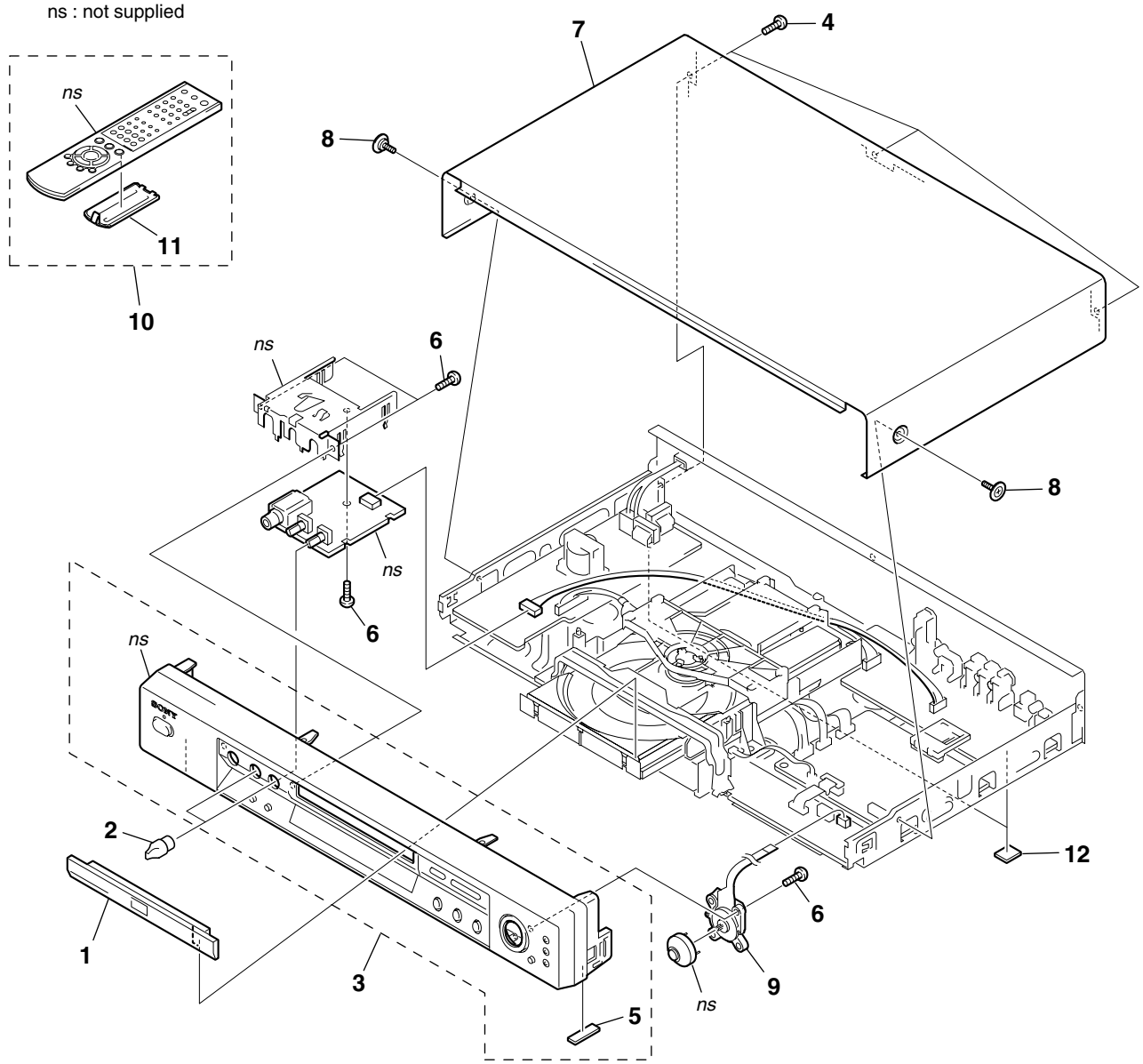
NOTE:

- -XX, -X mean standardized parts, so they may have some differences from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Abbreviation
  BR : Brazilian model
  E:HK ; Hong Kong model
  E:TW ; Taiwan model
  E:SP ; Singapore model
  ; Malaysia model
  ; Thailand model
  ; Philippine model
  ; Indonesia model
  ; Vietnum model

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

8-1-1. FRONT PANEL ASSEMBLY

ns : not supplied



Ref. No.	Part No.	Description	Remarks
1	X-3952-396-1	COVER ASSY, TRAY (EXCEPT BR)	
1	X-3952-630-1	COVER ASSY, TRAY (BR)	
2	3-059-379-51	KNOB, VOLUME	
3	X-3952-255-4	PANEL ASSY, FRONT	
4	3-710-901-61	SCREW, TAPPING	
5	3-059-349-11	LEG CUSHION	
6	3-970-608-51	SUMITITE (B3), +BV	
7	3-075-005-51	CASE	
8	3-070-883-11	SCREW, TAPPING	
9	1-786-131-11	SWITCH, TACTILE	
10	1-477-211-31	REMOTE COMMANDER (RMT-D145E)	(EXCEPT BR)
10	1-477-211-41	REMOTE COMMANDER (RMT-D145B)(BR)	
11	3-073-096-01	LID, BATTERY COVER	
12	3-959-372-02	CUSHION, FOOT	

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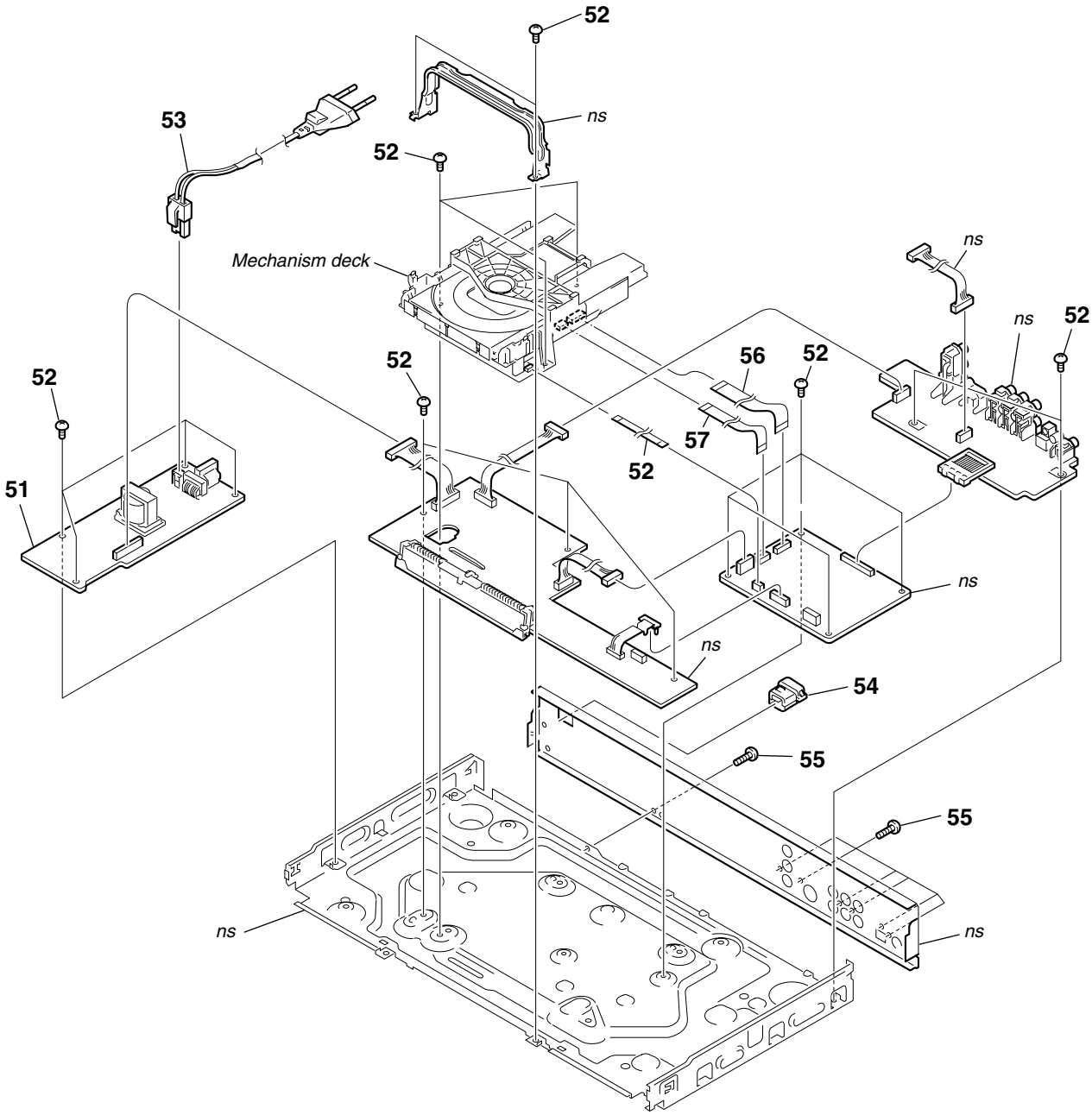
8-1-2. CHASSIS ASSEMBLY

ns : not supplied



Ref. No.	Part No.	Description	Remarks
⚠51	1-468-645-11	POWER BLOCK (HS11S1U)(E:TW)	
⚠51	1-468-646-11	POWER BLOCK (ETXNY381N2F)(E:HK,SP)	
⚠51	1-468-647-11	POWER BLOCK (HS11S1F)(BR)	
52	3-970-608-01	SUMITITE (B3), +BV	
⚠53	1-575-651-21	CORD, POWER (E:HK,SP)	
⚠53	1-757-813-11	CORD, POWER (BR)	

Ref. No.	Part No.	Description	Remarks
⚠53	1-824-303-11	CORD, POWER (E:TW)	
⚠54	3-073-182-02	BUSHING, CODE	
55	3-970-608-51	SUMITITE (B3), +BV	
56	1-757-693-11	CABLE, FLEXIBLE FLAT (FMO-001)	
57	1-757-694-11	CABLE, FLEXIBLE FLAT (FMO-002)	
58	1-757-697-11	CABLE, FLEXIBLE FLAT (FMM-035)	

Note : The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

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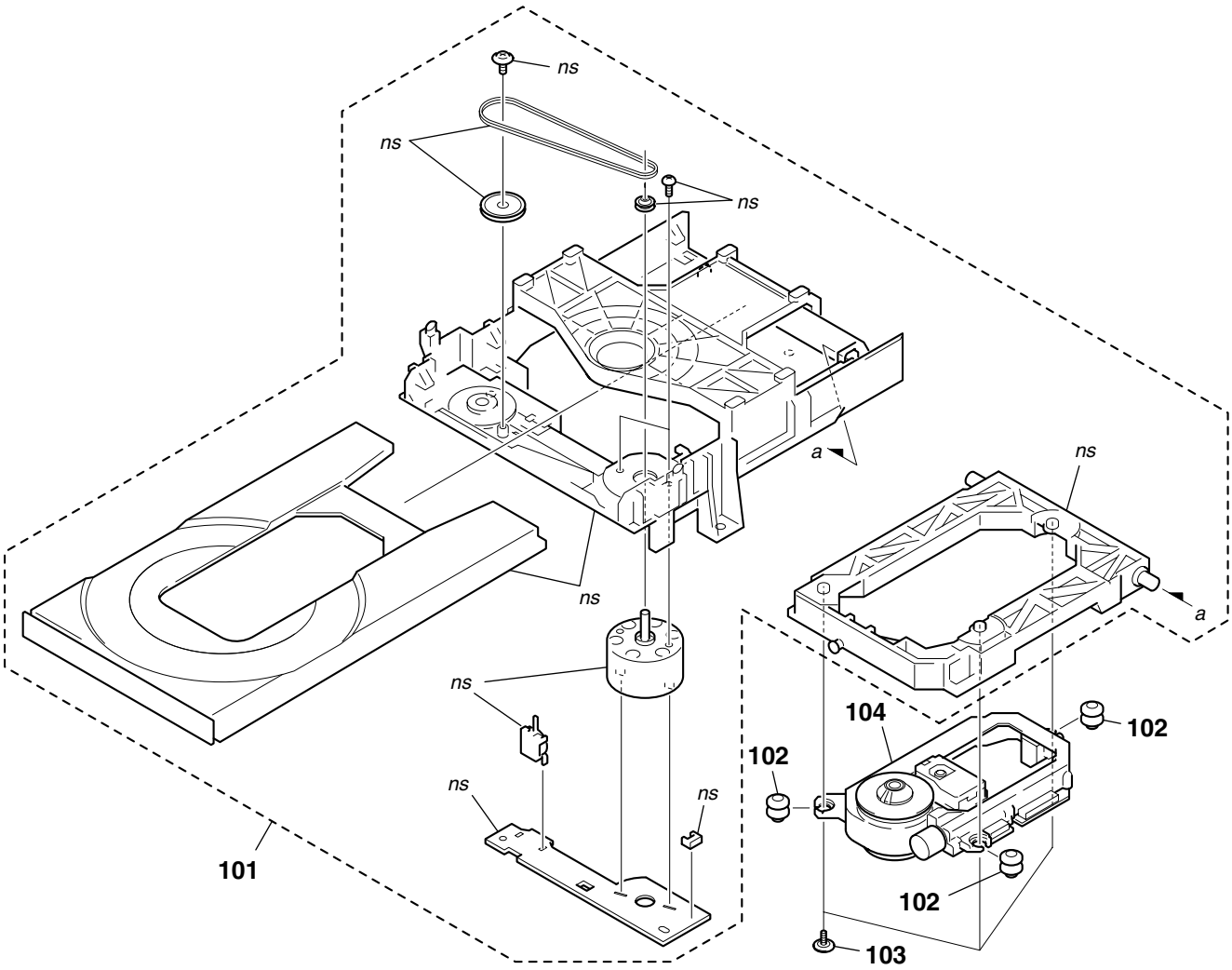
8-1-3. MECHANISM DECK ASSEMBLY

ns : not supplied



Ref. No.	Part No.	Description	Remarks
101	A-6060-425-A	LOADING ASSY (T)	
102	3-053-847-11	INSULATOR	
103	3-067-344-01	INSULATOR SCREW	
⚠104	A-6062-709-A	OPTICAL PICK-UP (KHM-270AAA/SERVICE ASSY)	

Note : The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

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8-2. ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- CAPACITORS:
  uF: µF
- COILS
  uH: µH
- RESISTORS
  All resistors are in ohms.
  METAL: metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F: nonflammable
- SEMICONDUCTORS
  In each case, u: µ, for example:
  uA...: µA... , uPA... , µPA... ,
  uPB... , µPB... , uPC... , µPC... ,
  uPD..., µPD...
- Abbreviation
  BR : Brazilian model
  E:HK ; Hong Kong model
  E:TW ; Taiwan model
  E:SP ; Singapore model
  ; Malaysia model
  ; Thailand model
  ; Philippine model
  ; Indonesia model
  ; Vietnum model

When indicating parts by reference number, please include the board name.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description				Remarks
		AV-63 BOARD, COMPLETE				
		**********				
		< CAPACITOR >				
C101	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C102	1-126-947-11	ELECT	47uF	20%	16V	
C103	1-163-259-91	CERAMIC CHIP	220PF	5%	50V	
C109	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V	
C110	1-126-947-11	ELECT	47uF	20%	16V	
C111	1-126-947-11	ELECT	47uF	20%	16V	
C112	1-107-725-11	CERAMIC CHIP	0.1uF	10%	16V	
C113	1-126-947-11	ELECT	47uF	20%	16V	
C114	1-107-725-11	CERAMIC CHIP	0.1uF	10%	16V	
C126	1-126-947-11	ELECT	47uF	20%	16V	
C201	1-163-135-00	CERAMIC CHIP	560PF	5%	50V	
C202	1-163-135-00	CERAMIC CHIP	560PF	5%	50V	
C203	1-163-257-11	CERAMIC CHIP	180PF	5%	50V	
C204	1-163-257-11	CERAMIC CHIP	180PF	5%	50V	
C205	1-163-257-11	CERAMIC CHIP	180PF	5%	50V	
C206	1-163-257-11	CERAMIC CHIP	180PF	5%	50V	
C207	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C208	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C209	1-126-960-11	ELECT	1uF	20%	50V	
C210	1-126-947-11	ELECT	47uF	20%	16V	
C211	1-126-947-11	ELECT	47uF	20%	16V	
C212	1-163-251-11	CERAMIC CHIP	100PF	5%	50V	
C213	1-163-251-11	CERAMIC CHIP	100PF	5%	50V	
C214	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C215	1-163-259-91	CERAMIC CHIP	220PF	5%	50V	
C216	1-163-259-91	CERAMIC CHIP	220PF	5%	50V	
C222	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C223	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C224	1-126-947-11	ELECT	47uF	20%	16V	
C226	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C227	1-126-947-11	ELECT	47uF	20%	16V	
C228	1-126-947-11	ELECT	47uF	20%	16V	
C229	1-126-947-11	ELECT	47uF	20%	16V	
C230	1-126-947-11	ELECT	47uF	20%	16V	
C231	1-126-934-11	ELECT	220uF	20%	16V	
C232	1-163-259-91	CERAMIC CHIP	220PF	5%	50V	
C242	1-126-924-11	ELECT	330uF	20%	6.3V	
C244	1-126-947-11	ELECT	47uF	20%	16V	
		< CONNECTOR >				
* CN202	1-568-934-11	PIN, CONNECTOR 7P				
* CN204	1-568-954-11	PIN, CONNECTOR 5P				

Ref. No.	Part No.	Description	Remarks
		< DIODE >	
D102	8-719-067-40	DIODE STZ6.8N-T146	
D103	8-719-067-40	DIODE STZ6.8N-T146	
D201	8-719-050-38	DIODE M1MA152WK-T1	
D202	8-719-050-37	DIODE M1MA152WA-T1	
D203	8-719-073-01	DIODE MA111-(K8).S0	
D205	8-719-073-01	DIODE MA111-(K8).S0	
		< TERMINAL >	
* ET101	1-537-738-21	TERMINAL, EARTH	
* ET202	1-537-738-21	TERMINAL, EARTH	
		< IC >	
IC101	8-759-662-86	IC NJM79M05DL1A(TE2)	
IC102	8-759-826-45	IC LA73050-TLM	
IC201	8-759-909-71	IC BA4558F-E2	
IC202	8-759-909-71	IC BA4558F-E2	
IC203	8-759-711-59	IC NJM78L05UA-TE1	
IC204	8-749-017-31	IC GP1FA550TZ (OPTICAL)	
		< JACK >	
J101	1-815-362-21	JACK, PIN (6P) (LINE OUT1-2)	
J103	1-794-198-11	CONNECTOR, S TERMINAL (S VIDEO OUT)	
J104	1-815-360-11	JACK, PIN 3P (COMPONENT VIDEO OUT)	
J201	1-793-446-21	JACK, PIN 1P (COAXIAL)	
		< JUMPER RESISTOR >	
JR100	1-216-295-91	SHORT CHIP 0	
JR101	1-216-295-91	SHORT CHIP 0	
JR102	1-216-295-91	SHORT CHIP 0	
JR103	1-216-295-91	SHORT CHIP 0	
JR104	1-216-295-91	SHORT CHIP 0	
JR105	1-216-295-91	SHORT CHIP 0	
JR106	1-216-295-91	SHORT CHIP 0	
JR107	1-216-295-91	SHORT CHIP 0	
JR108	1-216-295-91	SHORT CHIP 0	
JR109	1-216-295-91	SHORT CHIP 0	
		< COIL >	
L101	1-412-064-11	INDUCTOR 100uH	
		< TRANSISTOR >	
Q104	8-729-421-19	TRANSISTOR MUN2213T1	
Q105	8-729-424-08	TRANSISTOR MUN2111T1	
Q201	8-729-049-31	TRANSISTOR 2SB710A-RTX	
Q202	8-729-421-19	TRANSISTOR MUN2213T1	
Q203	8-729-010-25	TRANSISTOR MSD601-RT1	

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Ref. No.	Part No.	Description			Remarks
Q204	8-729-027-53	TRANSISTOR	DTC124TKA-T146		
Q205	8-729-010-05	TRANSISTOR	MSB709-RT1		
Q206	8-729-049-31	TRANSISTOR	2SB710A-RTX		
Q207	6-550-137-01	TRANSISTOR	SD1938(F)-ST(TX).SO		
Q208	6-550-137-01	TRANSISTOR	SD1938(F)-ST(TX).SO		
Q209	8-729-010-25	TRANSISTOR	MSD601-RT1		
Q211	8-729-010-25	TRANSISTOR	MSD601-RT1		
Q216	8-729-010-05	TRANSISTOR	MSB709-RT1		
Q217	6-550-137-01	TRANSISTOR	SD1938(F)-ST(TX).SO		
		< RESISTOR >			
R121	1-216-061-91	RES-CHIP	3.3K	5%	1/10W
R126	1-216-021-00	METAL CHIP	68	5%	1/10W
R127	1-216-021-00	METAL CHIP	68	5%	1/10W
R128	1-216-021-00	METAL CHIP	68	5%	1/10W
R129	1-216-073-91	RES-CHIP	10K	5%	1/10W
R130	1-216-021-00	METAL CHIP	68	5%	1/10W
R131	1-216-021-00	METAL CHIP	68	5%	1/10W
R133	1-216-021-00	METAL CHIP	68	5%	1/10W
R134	1-216-021-00	METAL CHIP	68	5%	1/10W
R162	1-216-295-91	SHORT CHIP	0		
R205	1-208-800-11	METAL CHIP	5.6K	0.5%	1/10W
R206	1-208-800-11	METAL CHIP	5.6K	0.5%	1/10W
R207	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R208	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R209	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R210	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R211	1-208-800-11	METAL CHIP	5.6K	0.5%	1/10W
R212	1-208-800-11	METAL CHIP	5.6K	0.5%	1/10W
R213	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R214	1-216-073-91	RES-CHIP	10K	5%	1/10W
R215	1-216-073-91	RES-CHIP	10K	5%	1/10W
R216	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R217	1-216-073-91	RES-CHIP	10K	5%	1/10W
R218	1-216-097-11	RES-CHIP	100K	5%	1/10W
R219	1-216-105-91	RES-CHIP	220K	5%	1/10W
R220	1-216-041-00	METAL CHIP	470	5%	1/10W
R221	1-216-073-91	RES-CHIP	10K	5%	1/10W
R222	1-216-073-91	RES-CHIP	10K	5%	1/10W
R223	1-216-073-91	RES-CHIP	10K	5%	1/10W
R224	1-216-073-91	RES-CHIP	10K	5%	1/10W
R225	1-216-089-91	RES-CHIP	47K	5%	1/10W
R226	1-216-041-00	METAL CHIP	470	5%	1/10W
R227	1-216-041-00	METAL CHIP	470	5%	1/10W
R228	1-216-073-91	RES-CHIP	10K	5%	1/10W
R229	1-216-089-91	RES-CHIP	47K	5%	1/10W
R230	1-216-089-91	RES-CHIP	47K	5%	1/10W
R231	1-216-089-91	RES-CHIP	47K	5%	1/10W
R232	1-216-073-91	RES-CHIP	10K	5%	1/10W
R233	1-216-073-91	RES-CHIP	10K	5%	1/10W
R234	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R235	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R236	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R237	1-216-073-91	RES-CHIP	10K	5%	1/10W
R238	1-216-097-11	RES-CHIP	100K	5%	1/10W
R239	1-208-798-11	METAL CHIP	4.7K	0.5%	1/10W

Ref. No.	Part No.	Description			Remarks
R240	1-216-041-00	METAL CHIP	470	5%	1/10W
R241	1-216-041-00	METAL CHIP	470	5%	1/10W
R242	1-216-041-00	METAL CHIP	470	5%	1/10W
R243	1-216-041-00	METAL CHIP	470	5%	1/10W
R249	1-216-033-00	METAL CHIP	220	5%	1/10W
R251	1-216-021-00	METAL CHIP	68	5%	1/10W
R252	1-216-073-91	RES-CHIP	10K	5%	1/10W
R253	1-216-049-11	RES-CHIP	1K	5%	1/10W
R254	1-216-049-11	RES-CHIP	1K	5%	1/10W
R255	1-208-798-11	METAL CHIP	4.7K	0.5%	1/10W
R256	1-216-049-11	RES-CHIP	1K	5%	1/10W
R257	1-208-798-11	METAL CHIP	4.7K	0.5%	1/10W
R258	1-208-798-11	METAL CHIP	4.7K	0.5%	1/10W
R260	1-216-073-91	RES-CHIP	10K	5%	1/10W
R261	1-216-073-91	RES-CHIP	10K	5%	1/10W
R262	1-216-073-91	RES-CHIP	10K	5%	1/10W
R263	1-216-073-91	RES-CHIP	10K	5%	1/10W
R279	1-216-295-91	SHORT CHIP	0		
R280	1-216-295-91	SHORT CHIP	0		
R282	1-216-295-91	SHORT CHIP	0		
R284	1-216-041-00	METAL CHIP	470	5%	1/10W
R285	1-216-073-91	RES-CHIP	10K	5%	1/10W
		IF-92 BOARD, COMPLETE			
		**********			
	3-067-239-01	HOLDER, FL			
		< CAPACITOR >			
C401	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C407	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C409	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C411	1-126-933-11	ELECT	100uF	20%	16V
C412	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C414	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C416	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C417	1-137-150-11	FILM	0.01uF	5%	100V
C419	1-104-666-11	ELECT	220uF	20%	25V
C420	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C421	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C422	1-115-339-11	CERAMIC CHIP	0.1uF	10%	50V
C425	1-119-943-91	ELECT	47uF	20%	50V
C426	1-128-551-11	ELECT	22uF	20%	25V
C427	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C428	1-128-551-11	ELECT	22uF	20%	25V
C429	1-104-665-11	ELECT	100uF	20%	25V
C431	1-115-339-11	CERAMIC CHIP	0.1uF	10%	50V
C432	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C437	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C440	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C441	1-126-947-11	ELECT	47uF	20%	25V
		< CONNECTOR >			
* CN405	1-785-530-11	PIN, CONNECTOR (PC BOARD) 10P			
CN406	1-815-381-11	CONNECTOR, FPC/FFC 5P			

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IF-92 MB-103

Ref. No.	Part No.	Description			Remarks
		< DIODE >			
D403	8-719-041-97	DIODE MA113-(TX)			
D404	8-719-041-97	DIODE MA113-(TX)			
D405	8-719-041-97	DIODE MA113-(TX)			
D406	8-719-041-97	DIODE MA113-(TX)			
D412	8-719-017-62	DIODE MA8068-L-TX			
		< FERRITE BEAD >			
FB401	1-469-324-21	FERRITE	0uH		
		< IC >			
IC403	6-701-875-01	IC LMS8117ADTX-1.8/NOPB			
IC404	6-802-218-01	IC 86CK74AFG-3RD4(M			
IC405	8-759-684-35	IC S-80830ANUP-EDT-T2			
IC406	8-749-019-11	IC GP1UD28SYK			
		< JUMPER RESISTOR >			
JR401	1-216-295-91	SHORT CHIP	0		
JR402	1-216-295-91	SHORT CHIP	0		
JR403	1-216-295-91	SHORT CHIP	0		
		< COIL >			
L401	1-408-978-21	INDUCTOR	47uH		
		< FLUORESCENT INDICATOR >			
ND401	1-518-806-11	TUBE, FLUORESCENT INDICATOR			
		< IC LINK >			
⚠PS401	1-576-509-21	RINK, IC			
⚠PS402	1-576-508-21	RINK, IC			
		< TRANSISTOR >			
Q401	8-729-056-46	TRANSISTOR	2SC5053T100Q		
Q402	8-729-056-46	TRANSISTOR	2SC5053T100Q		
Q404	8-729-048-28	TRANSISTOR	2SD1766-T100-QR		
Q405	8-729-424-08	TRANSISTOR	MUN2111T1		
		< RESISTOR >			
R414	1-216-059-00	METAL CHIP	2.7K	5%	1/10W
R415	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R416	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R417	1-216-063-91	RES-CHIP	3.9K	5%	1/10W
R418	1-216-073-91	RES-CHIP	10K	5%	1/10W
R421	1-216-059-00	METAL CHIP	2.7K	5%	1/10W
R422	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R423	1-216-081-00	METAL CHIP	22K	5%	1/10W
R424	1-216-013-00	METAL CHIP	33	5%	1/10W
R425	1-216-025-11	RES-CHIP	100	5%	1/10W
R426	1-216-063-91	RES-CHIP	3.9K	5%	1/10W
R427	1-216-063-91	RES-CHIP	3.9K	5%	1/10W
R428	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R430	1-216-059-00	METAL CHIP	2.7K	5%	1/10W
R431	1-216-063-91	RES-CHIP	3.9K	5%	1/10W
R433	1-216-073-91	RES-CHIP	10K	5%	1/10W
R434	1-216-073-91	RES-CHIP	10K	5%	1/10W
R435	1-216-073-91	RES-CHIP	10K	5%	1/10W
R437	1-216-027-00	METAL CHIP	120	5%	1/10W
R440	1-216-073-91	RES-CHIP	10K	5%	1/10W
R444	1-216-025-11	RES-CHIP	100	5%	1/10W
R446	1-216-097-11	RES-CHIP	100K	5%	1/10W
R448	1-216-073-91	RES-CHIP	10K	5%	1/10W
R449	1-216-073-91	RES-CHIP	10K	5%	1/10W
R450	1-216-073-91	RES-CHIP	10K	5%	1/10W
R454	1-216-073-91	RES-CHIP	10K	5%	1/10W (EXCEPT BR)
R455	1-216-073-91	RES-CHIP	10K	5%	1/10W (BR)
R471	1-216-073-91	RES-CHIP	10K	5%	1/10W
R473	1-216-073-91	RES-CHIP	10K	5%	1/10W
R474	1-216-025-11	RES-CHIP	100	5%	1/10W
R481	1-216-025-11	RES-CHIP	100	5%	1/10W
R482	1-216-025-11	RES-CHIP	100	5%	1/10W
R483	1-216-025-11	RES-CHIP	100	5%	1/10W
R484	1-216-025-11	RES-CHIP	100	5%	1/10W
R485	1-216-025-11	RES-CHIP	100	5%	1/10W
R489	1-216-097-11	RES-CHIP	100K	5%	1/10W
R490	1-216-083-00	METAL CHIP	27K	5%	1/10W
R496	1-216-017-91	RES-CHIP	47	5%	1/10W
R497	1-216-097-11	RES-CHIP	100K	5%	1/10W
		< SWITCH >			
S401	1-771-349-21	SWITCH, KEYBOARD (TOP MENU)			
S402	1-771-349-21	SWITCH, KEYBOARD (RETURN)			
S403	1-771-349-21	SWITCH, KEYBOARD (MENU)			
S404	1-771-349-21	SWITCH, KEYBOARD (DISPLAY)			
S405	1-771-349-21	SWITCH, KEYBOARD (STOP)			
S406	1-771-349-21	SWITCH, KEYBOARD (NEXT)			
S407	1-771-349-21	SWITCH, KEYBOARD (PAUSE)			
S408	1-771-349-21	SWITCH, KEYBOARD (PREV)			
S409	1-771-349-21	SWITCH, KEYBOARD (OPEN/CLOSE)			
S410	1-771-349-21	SWITCH, KEYBOARD (PICTURE MODE)			
S411	1-771-349-21	SWITCH, KEYBOARD (SURROUND)			
S412	1-771-349-21	SWITCH, KEYBOARD (PLAY)			
		< TRANSFORMER >			
T401	1-437-620-11	TRANSFORMER, DC-DC CONVERTER			
		< VIBRATOR >			
X401	1-781-472-21	VIBRATOR, CERAMIC			
		MB-103 BOARD, COMPLETE			
		**********			
		< CAPACITOR >			
C102	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C103	1-126-209-11	ELECT CHIP	100uF	20%	4V
C104	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C105	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C106	1-162-914-11	CERAMIC CHIP	9PF	0.50PF	50V
C107	1-162-914-11	CERAMIC CHIP	9PF	0.50PF	50V
C108	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C109	1-126-209-11	ELECT CHIP	100uF	20%	4V
C110	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C111	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V

Note : The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

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Ref. No.	Part No.	Description			Remarks
C114	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C118	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C120	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C121	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C122	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C125	1-126-607-11	ELECT CHIP	47uF	20%	4V
C126	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C127	1-126-204-11	ELECT CHIP	47uF	20%	16V
C128	1-126-246-11	ELECT CHIP	220uF	20%	4V
C129	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C201	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C202	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C203	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C204	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C210	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C211	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C212	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C213	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C214	1-164-245-11	CERAMIC CHIP	0.015uF	10%	25V
C215	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C216	1-164-230-11	CERAMIC CHIP	220PF	5%	50V
C218	1-162-965-11	CERAMIC CHIP	0.0015uF	10%	50V
C219	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C220	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C221	1-124-779-00	ELECT CHIP	10uF	20%	16V
C225	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C226	1-164-230-11	CERAMIC CHIP	220PF	5%	50V
C228	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C229	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C230	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C232	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C233	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C234	1-126-205-11	ELECT CHIP	47uF	20%	6.3V
C235	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C236	1-164-739-11	CERAMIC CHIP	560PF	5%	50V
C238	1-124-779-00	ELECT CHIP	10uF	20%	16V
C240	1-164-677-11	CERAMIC CHIP	0.033uF	10%	16V
C241	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C242	1-126-205-11	ELECT CHIP	47uF	20%	6.3V
C243	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C244	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C245	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C246	1-164-677-11	CERAMIC CHIP	0.033uF	10%	16V
C247	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C248	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C249	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C250	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C251	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C252	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C253	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C254	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C255	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C256	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C257	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C258	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C259	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C260	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C261	1-162-959-11	CERAMIC CHIP	330PF	5%	50V
C262	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C263	1-124-779-00	ELECT CHIP	10uF	20%	16V
C264	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C265	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C266	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C270	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C271	1-126-204-11	ELECT CHIP	47uF	20%	16V
C272	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C273	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C304	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C305	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C308	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C309	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C310	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C311	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C312	1-110-563-11	CERAMIC CHIP	0.068uF	10%	16V
C313	1-164-677-11	CERAMIC CHIP	0.033uF	10%	16V
C314	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C315	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C316	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C317	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C318	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C319	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C320	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C321	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C322	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C323	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C324	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C325	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C326	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C327	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C328	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C329	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C330	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C331	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C332	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C333	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C334	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C335	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C337	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C338	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C339	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C340	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C343	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C344	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C401	1-124-779-00	ELECT CHIP	10uF	20%	16V
C402	1-124-779-00	ELECT CHIP	10uF	20%	16V
C403	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C404	1-126-193-11	ELECT	1uF	20%	50V
C405	1-126-246-11	ELECT CHIP	220uF	20%	4V
C406	1-124-779-00	ELECT CHIP	10uF	20%	16V
C407	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C408	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C410	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C412	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C413	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C415	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C416	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C417	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C418	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C419	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C420	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V

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Ref. No.	Part No.	Description			Remarks
C422	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C423	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C425	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C426	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C428	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C429	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C431	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C432	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C435	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C436	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C438	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C439	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C441	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C442	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C446	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C447	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C449	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C602	1-127-715-91	CERAMIC CHIP	0.22uF	10%	16V
C603	1-124-779-00	ELECT CHIP	10uF	20%	16V
C604	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
		< CONNECTOR >			
* CN102	1-770-154-11	PIN, CONNECTOR (PC BOARD) 6P			
* CN103	1-770-470-21	PIN, CONNECTOR (PC BOARD) 6P			
CN203	1-815-507-21	CONNECTOR, FFC/FPC 26P			
		< FERRITE BEAD >			
FB103	1-469-324-21	FERRITE	0uH		
FB104	1-469-324-21	FERRITE	0uH		
FB105	1-469-324-21	FERRITE	0uH		
FB106	1-469-324-21	FERRITE	0uH		
FB107	1-469-324-21	FERRITE	0uH		
FB108	1-469-324-21	FERRITE	0uH		
FB109	1-469-324-21	FERRITE	0uH		
FB111	1-469-324-21	FERRITE	0uH		
FB602	1-414-226-21	FERRITE	0uH		
FB603	1-414-226-21	FERRITE	0uH		
		< FILTER >			
FL101	1-234-177-21	FERRITE	0uH		
FL102	1-234-177-21	FERRITE	0uH		
FL103	1-234-177-21	FERRITE	0uH		
FL104	1-234-177-21	FERRITE	0uH		
FL105	1-234-177-21	FERRITE	0uH		
FL106	1-234-177-21	FERRITE	0uH		
FL109	1-233-893-21	FILTER, CHIP EMI			
FL110	1-234-177-21	FERRITE	0uH		
FL201	1-234-177-21	FERRITE	0uH		
FL402	1-234-177-21	FERRITE	0uH		
FL403	1-234-177-21	FERRITE	0uH		
FL404	1-234-177-21	FERRITE	0uH		
		< IC >			
IC101	8-759-643-29	IC BR24C64F-E2			
IC103	6-701-590-01	IC SM8707EV-E2			
IC104	6-701-837-01	IC MB91307RPFV-G-BND-E1			
IC107	6-802-254-01	IC MR27V3202F-7TTPZ04B			
IC201	6-701-700-01	IC SP3728ACB			

Ref. No.	Part No.	Description			Remarks
IC202	6-701-878-01	IC FAN8034L			
IC301	6-701-876-01	IC CXD9703R			
IC302	8-759-599-45	IC MM1385ENLE			
IC303	8-759-643-10	IC GM71V18160			
IC401	6-702-300-01	IC TK11118CSCL-G			
IC402	8-759-599-45	IC MM1385ENLE			
IC403	8-752-416-45	IC CXD1935Q			
IC404	8-759-663-74	IC HY57V161610DTC-7TR			
IC405	8-759-663-74	IC HY57V161610DTC-7TR			
IC601	8-759-825-32	IC CXD9627N-E			
		< COIL >			
L101	1-414-410-21	INDUCTOR	10uH		
L201	1-412-031-11	INDUCTOR CHIP	47uH		
L202	1-412-031-11	INDUCTOR CHIP	47uH		
		< TRANSISTOR >			
Q201	8-729-903-46	TRANSISTOR	2SB1132-T100-QR		
Q202	8-729-903-46	TRANSISTOR	2SB1132-T100-QR		
		< RESISTOR >			
R103	1-216-809-11	METAL CHIP	100	5%	1/10W
R104	1-216-809-11	METAL CHIP	100	5%	1/10W
R105	1-216-809-11	METAL CHIP	100	5%	1/10W
R106	1-216-809-11	METAL CHIP	100	5%	1/10W
R108	1-216-789-11	METAL CHIP	2.2	5%	1/10W
R110	1-216-821-11	METAL CHIP	1K	5%	1/10W
R111	1-216-809-11	METAL CHIP	100	5%	1/10W
R112	1-216-809-11	METAL CHIP	100	5%	1/10W
R113	1-216-837-11	METAL CHIP	22K	5%	1/10W
R114	1-216-864-11	METAL CHIP	0		
R116	1-216-801-11	METAL CHIP	22	5%	1/10W
R117	1-216-821-11	METAL CHIP	1K	5%	1/10W
R118	1-216-845-11	METAL CHIP	100K	5%	1/10W
R119	1-216-845-11	METAL CHIP	100K	5%	1/10W
R120	1-216-821-11	METAL CHIP	1K	5%	1/10W
R121	1-216-821-11	METAL CHIP	1K	5%	1/10W
R123	1-216-833-11	METAL CHIP	10K	5%	1/10W
R124	1-216-833-11	METAL CHIP	10K	5%	1/10W
R128	1-216-809-11	METAL CHIP	100	5%	1/10W
R129	1-216-809-11	METAL CHIP	100	5%	1/10W
R130	1-216-809-11	METAL CHIP	100	5%	1/10W
R131	1-216-809-11	METAL CHIP	100	5%	1/10W
R132	1-216-864-11	METAL CHIP	0		
R133	1-216-864-11	METAL CHIP	0		
R134	1-216-801-11	METAL CHIP	22	5%	1/10W
R136	1-216-801-11	METAL CHIP	22	5%	1/10W
R137	1-216-801-11	METAL CHIP	22	5%	1/10W
R139	1-216-827-11	METAL CHIP	3.3K	5%	1/10W
R141	1-216-833-11	METAL CHIP	10K	5%	1/10W
R150	1-216-833-11	METAL CHIP	10K	5%	1/10W
R156	1-216-833-11	METAL CHIP	10K	5%	1/10W
R157	1-216-864-11	METAL CHIP	0		
R159	1-216-864-11	METAL CHIP	0		
R160	1-216-864-11	METAL CHIP	0		
R162	1-216-827-11	METAL CHIP	3.3K	5%	1/10W

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Ref. No.	Part No.	Description			Remarks
R163	1-216-827-11	METAL CHIP	3.3K	5%	1/10W
R164	1-216-057-00	METAL CHIP	2.2K	5%	1/10W (EXCEPT BR)
R164	1-216-061-91	METAL CHIP	3.3K	5%	1/10W (BR)
R165	1-216-827-11	METAL CHIP	3.3K	5%	1/10W
R166	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R168	1-216-827-11	METAL CHIP	3.3K	5%	1/10W
R169	1-216-075-00	METAL CHIP	12K	5%	1/10W (BR)
R169	1-216-081-00	METAL CHIP	22K	5%	1/10W (EXCEPT BR)
R176	1-216-864-11	METAL CHIP	0		
R177	1-216-833-11	METAL CHIP	10K	5%	1/10W
R178	1-216-833-11	METAL CHIP	10K	5%	1/10W
R180	1-216-809-11	METAL CHIP	100	5%	1/10W
R181	1-216-864-11	METAL CHIP	0		
R182	1-216-809-11	METAL CHIP	100	5%	1/10W
R183	1-216-809-11	METAL CHIP	100	5%	1/10W
R184	1-216-833-11	METAL CHIP	10K	5%	1/10W
R185	1-216-821-11	METAL CHIP	1K	5%	1/10W
R187	1-216-864-11	METAL CHIP	0		
R206	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R207	1-216-809-11	METAL CHIP	100	5%	1/10W
R210	1-216-815-11	METAL CHIP	330	5%	1/10W
R211	1-216-809-11	METAL CHIP	100	5%	1/10W
R212	1-216-809-11	METAL CHIP	100	5%	1/10W
R213	1-216-833-11	METAL CHIP	10K	5%	1/10W
R214	1-216-833-11	METAL CHIP	10K	5%	1/10W
R216	1-216-821-11	METAL CHIP	1K	5%	1/10W
R217	1-216-821-11	METAL CHIP	1K	5%	1/10W
R218	1-216-846-11	METAL CHIP	120K	5%	1/10W
R219	1-216-846-11	METAL CHIP	120K	5%	1/10W
R220	1-216-847-11	METAL CHIP	150K	5%	1/10W
R221	1-216-847-11	METAL CHIP	150K	5%	1/10W
R222	1-216-842-11	METAL CHIP	56K	5%	1/10W
R223	1-216-842-11	METAL CHIP	56K	5%	1/10W
R224	1-216-850-11	METAL CHIP	270K	5%	1/10W
R225	1-216-833-11	METAL CHIP	10K	5%	1/10W
R226	1-216-853-11	METAL CHIP	470K	5%	1/10W
R227	1-216-846-11	METAL CHIP	120K	5%	1/10W
R229	1-216-833-11	METAL CHIP	10K	5%	1/10W
R230	1-216-839-11	METAL CHIP	33K	5%	1/10W
R231	1-216-855-11	METAL CHIP	680K	5%	1/10W
R232	1-216-839-11	METAL CHIP	33K	5%	1/10W
R233	1-216-853-11	METAL CHIP	470K	5%	1/10W
R234	1-216-803-11	METAL CHIP	33	5%	1/10W
R235	1-216-809-11	METAL CHIP	100	5%	1/10W
R236	1-216-803-11	METAL CHIP	33	5%	1/10W
R238	1-216-839-11	METAL CHIP	33K	5%	1/10W
R239	1-216-839-11	METAL CHIP	33K	5%	1/10W
R240	1-216-839-11	METAL CHIP	33K	5%	1/10W
R241	1-216-839-11	METAL CHIP	33K	5%	1/10W
R242	1-216-849-11	METAL CHIP	220K	5%	1/10W
R243	1-216-853-11	METAL CHIP	470K	5%	1/10W
R244	1-216-821-11	METAL CHIP	1K	5%	1/10W
R245	1-216-841-11	METAL CHIP	47K	5%	1/10W
R246	1-216-809-11	METAL CHIP	100	5%	1/10W
R248	1-216-803-11	METAL CHIP	33	5%	1/10W

Ref. No.	Part No.	Description			Remarks
R249	1-216-803-11	METAL CHIP	33	5%	1/10W
R250	1-218-895-11	METAL CHIP	100K	0.5%	1/10W
R251	1-216-841-11	METAL CHIP	47K	5%	1/10W
R252	1-216-839-11	METAL CHIP	33K	5%	1/10W
R253	1-218-889-11	METAL CHIP	56K	0.5%	1/10W
R254	1-218-895-11	METAL CHIP	100K	0.5%	1/10W
R255	1-218-889-11	METAL CHIP	56K	0.5%	1/10W
R256	1-216-809-11	METAL CHIP	100	5%	1/10W
R259	1-216-833-11	METAL CHIP	10K	5%	1/10W
R260	1-216-834-11	METAL CHIP	12K	5%	1/10W
R261	1-216-833-11	METAL CHIP	10K	5%	1/10W
R262	1-216-815-11	METAL CHIP	330	5%	1/10W
R263	1-216-861-11	METAL CHIP	2.2M	5%	1/10W
R264	1-216-845-11	METAL CHIP	100K	5%	1/10W
R265	1-216-838-11	METAL CHIP	27K	5%	1/10W
R269	1-216-833-11	METAL CHIP	10K	5%	1/10W
R273	1-216-864-11	METAL CHIP	0		
R301	1-216-295-91	SHORT CHIP	0		
R302	1-216-295-91	SHORT CHIP	0		
R303	1-216-821-11	METAL CHIP	1K	5%	1/10W
R311	1-216-809-11	METAL CHIP	100	5%	1/10W
R312	1-218-831-11	METAL CHIP	220	0.5%	1/10W
R313	1-216-817-11	METAL CHIP	470	5%	1/10W
R314	1-216-817-11	METAL CHIP	470	5%	1/10W
R315	1-216-817-11	METAL CHIP	470	5%	1/10W
R316	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R317	1-216-833-11	METAL CHIP	10K	5%	1/10W
R318	1-216-817-11	METAL CHIP	470	5%	1/10W
R319	1-218-871-11	METAL CHIP	10K	0.5%	1/10W
R320	1-218-883-11	METAL CHIP	33K	0.5%	1/10W
R321	1-218-879-11	METAL CHIP	22K	0.5%	1/10W
R322	1-218-847-11	METAL CHIP	1K	0.5%	1/10W
R323	1-218-855-11	METAL CHIP	2.2K	0.5%	1/10W
R324	1-216-833-11	METAL CHIP	10K	5%	1/10W
R325	1-218-867-11	RES-CHIP	6.8K	5%	1/10W
R326	1-216-833-11	METAL CHIP	10K	5%	1/10W
R327	1-218-871-11	METAL CHIP	10K	0.5%	1/10W
R328	1-216-838-11	METAL CHIP	27K	5%	1/10W
R329	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R330	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R331	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R332	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R333	1-216-847-11	METAL CHIP	150K	5%	1/10W
R334	1-218-853-11	METAL CHIP	1.8K	0.5%	1/10W
R335	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R336	1-216-833-11	METAL CHIP	10K	5%	1/10W
R346	1-216-833-11	METAL CHIP	10K	5%	1/10W
R347	1-216-833-11	METAL CHIP	10K	5%	1/10W
R348	1-216-833-11	METAL CHIP	10K	5%	1/10W
R349	1-216-833-11	METAL CHIP	10K	5%	1/10W
R351	1-216-295-91	SHORT CHIP	0		
R352	1-216-295-91	SHORT CHIP	0		
R358	1-216-833-11	METAL CHIP	10K	5%	1/10W
R359	1-216-833-11	METAL CHIP	10K	5%	1/10W
R360	1-216-809-11	METAL CHIP	100	5%	1/10W
R401	1-216-295-91	SHORT CHIP	0		
R402	1-216-295-91	SHORT CHIP	0		
R403	1-216-817-11	METAL CHIP	470	5%	1/10W
R405	1-216-809-11	METAL CHIP	100	5%	1/10W
R406	1-218-831-11	METAL CHIP	220	0.5%	1/10W

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Ref. No.	Part No.	Description			Remarks
R407	1-218-831-11	METAL CHIP	220	0.5%	1/10W
R408	1-218-831-11	METAL CHIP	220	0.5%	1/10W
R409	1-218-831-11	METAL CHIP	220	0.5%	1/10W
R410	1-218-831-11	METAL CHIP	220	0.5%	1/10W
R411	1-218-831-11	METAL CHIP	220	0.5%	1/10W
R412	1-216-833-11	METAL CHIP	10K	5%	1/10W
R413	1-218-867-11	RES-CHIP	6.8K	5%	1/10W
R414	1-216-822-11	METAL CHIP	1.2K	5%	1/10W
R423	1-216-833-11	METAL CHIP	10K	5%	1/10W
R426	1-216-833-11	METAL CHIP	10K	5%	1/10W
R430	1-216-797-11	METAL CHIP	10	5%	1/10W
R439	1-216-864-11	METAL CHIP	0		
R601	1-216-809-11	METAL CHIP	100	5%	1/10W
R607	1-216-864-11	METAL CHIP	0		
R608	1-216-864-11	METAL CHIP	0		
R609	1-216-864-11	METAL CHIP	0		
R612	1-216-864-11	METAL CHIP	0		
		< COMPOSITION CIRCUIT BLOCK >			
* RB102	1-233-270-11	NETWORK, RES (8 GANG) 10K			
		< VARIABLE RESISTOR >			
RV401	1-223-583-11	RES, ADJ, CARBON 1K			
		< VIBRATOR >			
X101	1-795-174-11	VIBRATOR, CERAMIC (16.5MHz)			
X102	1-781-867-21	VIBRATOR, CRYSTAL (27MHz)			
		MC-139 BOARD, COMPLETE			
		**********			
		< CAPACITOR >			
C501	1-115-416-11	CERAMIC CHIP	0.001uF	5%	25V
C502	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C503	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C504	1-124-257-00	ELECT	2.2uF	20%	50V
C505	1-115-416-11	CERAMIC CHIP	0.001uF	5%	25V
C506	1-126-163-11	ELECT	4.7uF	20%	50V
C507	1-163-263-11	CERAMIC CHIP	330PF	5%	50V
C508	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C510	1-124-257-00	ELECT	2.2uF	20%	50V
C511	1-115-416-11	CERAMIC CHIP	0.001uF	5%	25V
C512	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C513	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C514	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C515	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C516	1-115-416-11	CERAMIC CHIP	0.001uF	5%	25V
C518	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C519	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C520	1-124-589-11	ELECT	47uF	20%	16V
C521	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C522	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C523	1-124-589-11	ELECT	47uF	20%	16V
C524	1-128-131-11	ELECT	22uF	20%	50V
C525	1-163-019-00	CERAMIC CHIP	0.0068uF	10%	50V
C526	1-124-589-11	ELECT	47uF	20%	16V
C527	1-164-343-11	CERAMIC CHIP	0.056uF	10%	25V

Ref. No.	Part No.	Description			Remarks
C528	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C529	1-164-344-11	CERAMIC CHIP	0.068uF	10%	25V
C530	1-164-344-11	CERAMIC CHIP	0.068uF	10%	25V
C531	1-164-161-11	CERAMIC CHIP	0.0022uF	10%	50V
C532	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C533	1-124-589-11	ELECT	47uF	20%	16V
C534	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C535	1-115-340-11	CERAMIC CHIP	0.22uF	10%	25V
C536	1-115-340-11	CERAMIC CHIP	0.22uF	10%	25V
C537	1-163-019-00	CERAMIC CHIP	0.0068uF	10%	50V
C538	1-128-131-11	ELECT	22uF	20%	50V
C539	1-126-160-11	ELECT	1uF	20%	50V
		< CONNECTOR >			
* CN501	1-568-943-11	PIN, CONNECTOR 5P			
		< DIODE >			
D501	8-719-056-85	DIODE UDZSTE-178.2B			
D502	8-719-800-76	DIODE MA153-TX			
		< IC >			
IC501	8-759-909-71	IC BA4558F-E2			
IC502	8-759-369-74	IC NJM4556AM-TE2			
IC503	8-759-496-41	IC M65850FP-E1			
IC504	8-759-711-59	IC NJM78L05UA-TE1			
		< JUMPER RESISTOR >			
JR501	1-216-295-00	METAL CHIP	0		
JR502	1-216-295-00	METAL CHIP	0		
JR503	1-216-295-00	METAL CHIP	0		
JR504	1-216-295-00	METAL CHIP	0		
JR505	1-216-295-00	METAL CHIP	0		
JR507	1-216-295-00	METAL CHIP	0		
		< COIL >			
L501	1-469-561-21	INDUCTOR	100uH		
		< TRANSISTOR >			
Q501	8-729-027-53	TRANSISTOR	DTC124TKA-T146		
Q502	8-729-010-05	TRANSISTOR	MSB709-RT1		
		< RESISTOR >			
R501	1-216-295-91	SHORT CHIP	0		
R502	1-216-295-91	SHORT CHIP	0		
R503	1-216-295-91	SHORT CHIP	0		
R504	1-216-295-91	SHORT CHIP	0		
R505	1-216-025-11	RES-CHIP	100	5%	1/10W
R506	1-216-097-11	RES-CHIP	100K	5%	1/10W
R507	1-216-097-11	RES-CHIP	100K	5%	1/10W
R508	1-216-049-11	RES-CHIP	1K	5%	1/10W
R509	1-216-085-91	RES-CHIP	33K	5%	1/10W
R510	1-216-073-91	RES-CHIP	10K	5%	1/10W
R511	1-216-025-11	RES-CHIP	100	5%	1/10W
R512	1-216-073-91	RES-CHIP	10K	5%	1/10W
R514	1-216-063-91	RES-CHIP	3.9K	5%	1/10W
R515	1-216-073-91	RES-CHIP	10K	5%	1/10W
R516	1-216-073-91	RES-CHIP	10K	5%	1/10W

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Ref. No.	Part No.	Description			Remarks
R517	1-216-073-91	RES-CHIP	10K	5%	1/10W
R518	1-216-063-91	RES-CHIP	3.9K	5%	1/10W
R519	1-216-073-91	RES-CHIP	10K	5%	1/10W
R520	1-216-081-00	METAL CHIP	22K	5%	1/10W
R521	1-216-081-00	METAL CHIP	22K	5%	1/10W
R522	1-216-081-00	METAL CHIP	22K	5%	1/10W
R523	1-216-097-11	RES-CHIP	100K	5%	1/10W
R524	1-216-083-00	METAL CHIP	27K	5%	1/10W
R525	1-216-081-00	METAL CHIP	22K	5%	1/10W
R526	1-216-081-00	METAL CHIP	22K	5%	1/10W
R527	1-216-295-91	SHORT CHIP	0		
R528	1-216-073-91	RES-CHIP	10K	5%	1/10W
R529	1-216-073-91	RES-CHIP	10K	5%	1/10W
R530	1-216-073-91	RES-CHIP	10K	5%	1/10W
R531	1-216-089-91	RES-CHIP	47K	5%	1/10W
R532	1-216-081-00	METAL CHIP	22K	5%	1/10W
R533	1-216-109-00	METAL CHIP	330K	5%	1/10W
		< VARIABLE RESISTOR >			
RV501	1-227-461-11	CARBON FILM POTENTIOMETER (ECHO LEVEL)			
RV502	1-227-461-11	CARBON FILM POTENTIOMETER (MIC LEVEL)			
		MS-81 BOARD			
		**********			
		< CONNECTOR >			
CN001	1-815-412-11	CONNECTOR, FFC/FPC 5P			
		< SWITCH >			
S001	1-786-133-11	SWITCH, ROTARY			
⚠	1-468-645-11	POWER BLOCK (HS11S1U)(E:TW)			
		**********			
		< FUSE >			
⚠F101	1-533-296-11	FUSE (2A/125V)			
⚠	1-468-646-11	POWER BLOCK (ETXNY381N2F)(E:HK,SP)			
		**********			
		< FUSE >			
⚠F101	9-885-020-87	FUSE (2A/250V)			
⚠	1-468-647-11	POWER BLOCK (HS11S1F)(BR)			
		**********			
		< FUSE >			
⚠F101	1-532-503-31	FUSE (2A/250V)			

Ref. No.	Part No.	Description	Remarks
		MISCELLANEOUS	
		**********	
⚠51	1-468-645-11	POWER BLOCK (HS11S1U)(E:TW)	
⚠51	1-468-646-11	POWER BLOCK (ETXNY381N2F)(E:HK,SP)	
⚠51	1-468-647-11	POWER BLOCK (HS11S1F)(BR)	
⚠53	1-575-651-21	CORD, POWER (E:HK,SP)	
⚠53	1-757-813-11	CORD, POWER (BR)	
⚠53	1-824-303-11	CORD, POWER (E:TW)	
56	1-757-693-11	CABLE, FLEXIBLE FLAT (FMO-001)	
57	1-757-694-11	CABLE, FLEXIBLE FLAT (FMO-002)	
58	1-757-697-11	CABLE, FLEXIBLE FLAT (FMM-035)	
		ACCESSORIES	
		**********	
	1-477-211-31	REMOTE COMMANDER (RMT-D145E) (EXCEPT BR)	
	1-477-211-41	REMOTE COMMANDER (RMT-D145B)(BR)	
	1-770-019-11	ADAPTOR, CONVERSION PLUG 3P (E:HK)	
	1-823-364-21	CORD, CONNECTION	
	3-073-096-01	LID, BATTERY COVER	
	3-074-928-11	MANUAL, INSTRUCTION (ENGLISH)(E)	
	3-074-928-21	MANUAL, INSTRUCTION (SIMPLIFIED CHINESE)(E:SP)	
	3-074-928-31	MANUAL, INSTRUCTION (TRADITIONAL CHINESE)(E:HK)	
	3-074-928-41	MANUAL, INSTRUCTION (TRADITIONAL CHINESE)(E:TW)	
	3-076-607-11	MANUAL, INSTRUCTION (SPANISH)(BR)	

Note : The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

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